



Anchorage School District

SPRING HILL ELEMENTARY SCHOOL ROOF REPLACEMENT

**ITB 2024-813
ASD PROJECT No. 362012**

DATE ISSUED: March 5, 2024

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INVITATION TO BID (ITB) NUMBER: 2024-813
Spring Hill Elementary School Roof Replacement

Sealed bids will be received in accordance with the time schedule shown below by the Anchorage School District, Purchasing Department, located at 4919 Van Buren Street Anchorage, Alaska 99517 for Spring Hill Elementary School Roof Replacement per the attached Instructions to Bidders, General Conditions, Technical Specifications, Drawings and Bid Form.

ESTIMATED CONSTRUCTION COST: Between \$1,000,000 - \$5,000,000

On-Site Visit:	March 12, 2024 at 10:00 a.m. Local Time
Pre-Bid Conference:	March 13, 2024 at 3:00 p.m. Local Time
Second On-Site Visit:	March 18, 2024 at 4:00 p.m. Local Time
Bid Opening:	March 27, 2024 at 2:00 p.m. Local Time

At the above indicated time, the bids will be opened publicly and read. Bids received by the Purchasing Department after the time fixed for opening of the bids will not be considered. Time of receipt will be as determined by the time stamp at the Purchasing Department.

DOCUMENTS:

Prospective bidders may obtain copies of bidding documents at the Anchorage School District website <http://www.asdk12.org/depts/purchasing/PurchasingBids.aspx> Only electronic versions of this ITB are issued.

A copy of the current plan holder's list can be viewed at:
http://apps.asdk12.org/depts/purchasing/meeting/Plan_Holders/2024/813.xlsx

NOTICE TO BIDDERS:

A bid bond in the amount of five (5%) percent of the total amount of the base bid will be required (**cash, personal or business checks are unacceptable**). The successful Contractor shall be required to furnish 100 percent performance and payment bonds.

The Anchorage School District reserves the right to reject any and all bids, and to waive any informalities or irregularities in bidding procedures.

ON-SITE VISIT AND PRE-BID CONFERENCE:

An On-Site Visit will be held on March 12, 2024 at 10:00 a.m. Local Time at Spring Hill Elementary School, 9911 Lake Otis Parkway, Anchorage, Alaska 99507. Please meet at the Front Office.

A second On-Site Visit will be held on March 18, 2024 at 4:00 p.m. Local Time at Spring Hill Elementary School, 9911 Lake Otis Parkway, Anchorage, Alaska 99507. Please meet at the Front Office.

A Pre-Bid Conference will be held March 13, 2024 at 3:00 p.m. Local Time at Anchorage School District, Purchasing Department, located at 4919 Van Buren Street Anchorage, Alaska 99517. Prospective Bidders who wish to participate by teleconference may participate by calling (907) 742-6750. The line will be available approximately 5 minutes prior the conference start time.

All Bidders are encouraged to attend the On-site Visits and Pre-Bid Conference. Major sub-bidders are also encouraged to attend.

The Anchorage School District is committed to providing reasonable accommodations, according to applicable state and federal laws, to all individuals with a qualifying disability. If you require a reasonable accommodation in order to participate in this or any other district process, please contact the Anchorage School District's Compliance/Equal Employment Opportunity Office at (907) 742-4132.

END OF SECTION

INSTRUCTIONS TO BIDDERS

PART 1 GENERAL INFORMATION

- 1.01 Refer to the Invitation to Bid for information relating to time, date and place for receipt of bids and other pertinent bidding information.
- 1.02 Anchorage School Board Policy 3515.5 prohibits a contractor whose employees or agents may have direct or incidental contact with Anchorage School District (the District) students from sending any employee or agent to district property who has been convicted of a sex offense under federal law or the law of any state and who is required to register as a sex offender under Alaska law or by court order, or who has been convicted of child kidnapping under federal law or the law of any state and who is required under Alaska law or court order to register on the Alaska Department of Public Safety Sex Offender/Child Kidnapper Central Registry. Board Policy 3515.5 requires contractors to certify in writing the contractor's knowledge of and compliance with Board Policy 3515.5. **Prior to executing a contract** for this project, the selected Contractor shall verify that no employee or agent who will be on district property is registered as a sex offender or child kidnapper in Alaska [Alaska Department of Public Safety "Sex Offender/Child Kidnapper Registry"] or in any other state. In addition, the contractor shall certify that, to its knowledge, no employee or agent is a convicted sex offender or child kidnapper. The required forms of certification are included in the bid documents.
- 1.03 LICENSE REQUIREMENTS
- A. The bidder shall include on the bid Form his current Business License number and expiration date from the State of Alaska authorizing him to engage in business to operate as a Business, Specialty or General Contractor, as well as his Federal Tax Identification number.
- B. The bidder shall provide a copy of his current State of Alaska Business License and Specialty or General Contractor license when requested in writing by the Purchasing Department.
- 1.04 BIDS
- A. The bidder shall review all of the proposed contract documents to ascertain all of the requirements of the work.
- 1.05 EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS AND SITE WORK
- A. The bidder shall examine carefully the site of the proposed work, the proposal, plans, specifications and contract forms before submitting a proposal. The submission of a bid shall be an admission that the bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work and as to the requirement and accuracy of the plans, specifications, special provisions and terms of the contract.
- B. All documents furnished to any person, under any condition, remain the property of the Anchorage School District and shall be returned immediately upon request.
- C. Documents may be obtained upon the conditions set forth in the Invitation to Bid.
- 1.06 METHOD FOR CLARIFICATION
- A. Any bidder in doubt as to the meaning of any part of the plans, specifications or other documents may submit a written request for an interpretation. The bidder submitting the

request will be responsible for its prompt delivery not less than seven (7) working days prior to the date set for opening of bids. Questions can be delivered as follows:

1. Fax: (907) 243-6293
2. Email: purchasing@asdk12.org
3. Mail: Purchasing Department
4919 Van Buren Street
Anchorage, Alaska 99517
4. Hours: 7:30 a.m. – 4:00 p.m.

- B. A written request for an interpretation, which in the opinion of the Purchasing Department requires a reply, will be answered by issuing an addendum to all plan holders prior to the bid opening. The Owner will not be responsible for any other explanation or interpretation of the plans, specifications or other documents made or given prior to the bid opening.

1.07 PREPARATION OF BIDS

- A. Preparation and Submission:

Bids must be submitted on the forms furnished or copies thereof, and must be manually signed. In order to secure consideration, the bid must be submitted and sealed in an envelope on which contract identification is plainly marked on the outside. The bid form is included in the bidding documents. The envelope shall be addressed as indicated in the Invitation to Bid.

- B. Form:

The bid may provide for a quotation of a price, or prices, for one or more items which may be lump sum bids, alternate prices, scheduled items resulting in a bid on a unit of construction, or a combination thereof. Where required on the bid form, bidders must quote on all items and they are warned that failure to do so shall disqualify the bid.

If erasures or other changes appear on the forms, each such erasure or change must be initialed by the person signing the bid.

- C. Alternate Bids and Qualified Bids:

Bids may be rejected if they show any omissions, alteration of the forms, additions not called for, conditional or alternate bids not called for or irregularities of any kind.

1.08 BID GUARANTEE

- A. Each bid shall be accompanied by a bid bond with good and sufficient surety or sureties acceptable to the Owner. The Anchorage School District will require five percent (5%) of the total amount of the base bid as a guarantee (**cash, personal, or business checks are not acceptable**). Bid guarantees for the three (3) low bidders will be held until the contract is executed.
- B. All other bid guarantees will be returned within seven (7) days of the bid opening. Power of Attorney for the official signing of the bond for the surety company must be submitted with the bond.

1.09 ALTERNATES

- A. The bidder shall include in the spaces provided on the "Bid Form" a bid for each alternate, if applicable.
- B. The Owner may accept alternates in any order or number and include them in the contract award price.

1.10 UNIT PRICES

- A. The bidder shall include in the spaces provided on the "Bid Form" a bid for each unit price, if applicable.
- B. The Owner may accept any or all of these unit prices and include them in the contract award price.
- C. In the case of discrepancy in the extended price calculation(s), the unit price(s) will prevail.

1.11 BIDDER QUALIFICATIONS (TO BE INCLUDED IF THERE IS NO 2-STEP QUALIFICATION PROCESS)

- A. Before the bid is considered for award, the Owner reserves the right to request the bidder to complete within seventy-two (72) hours a bidder qualification form and/or a current financial statement prepared by a Certified Public Accountant. Bidder qualifications to be listed upon the qualification form will include, as a minimum, a listing of bidder's previous contracts of a nature similar to that being bid upon; a listing of bidder's staff, to include managerial, technical and laboring positions; summary of bidder's plan and equipment available for use in the execution of the contract; and a listing of the projects to which the bidder is obligated in the near future. The Owner reserves the right to reject the bid of any bidder who fails to furnish promptly and properly all the information required in this paragraph.
- B. A bidder will be deemed to be unqualified to perform the contract if, after review and verification of the representations included on the qualification form submitted by the bidder, the following conditions appear:
 - 1. Bidder does not have sufficient prior experience (or an acceptable substitute thereof, as described below) with projects of a similar nature in technical, managerial and financial requirements to that in the present contract being bid.
 - a. Experience does not necessarily mean that the bidder is an established Contractor in the exact technical area for which the bid is submitted. In addition to such established contractors, newly established contractors will be considered qualified if they have shown on the bid qualification sheet form that they are staffed with sufficient technical, managerial and financial personnel with prior experience in the nature of construction for which the bids are invited, that bidder may adequately foresee and appreciate problems of such construction.
 - 2. Bidder does not have sufficient capability to undertake the obligations of the contract. A determination in this respect will be made when the Owner, upon review of the probable cash flow needs of the Contractor for this particular contract (to include payroll, cost of material and supplies, equipment rental costs and any other direct or incidental costs of the contract), determines that the Contractor does

not have sufficient financial resources to enable him to satisfy his financial obligations under the contract. The Owner will consider all other pertinent financial data required by this clause and submitted by the Contractor. A determination that the bidder is unqualified will not be made under this paragraph unless the Owner has determined that the bidder cannot meet his financial obligations under the contract after having considered all sources of income available to the bidder.

3. The bidder does not have sufficient staff, equipment or plant available to perform the contract. The Owner's determination in this matter will be based upon that represented by the bidder in his completion of the Bidder Qualification documents discussed above.
4. The bidder has a consistent history of unsatisfactory performance of contracts of this or similar nature, regardless of whether such contracts existed between the Owner and the Contractor, or other parties and the Contractor.
 - a. A determination of this nature will not be made unless the Owner, after review and verification of the contractor's previous work experience, determines that the contractor's consistent, unsatisfactory performance has resulted from the contractor's failure rather than a failure to perform by the other party. The Owner will give the Contractor an opportunity to explain such nonperformance(s) before any final determination is reached. Contract disputes which are pending resolution before any duly authorized judicial or administrative body will not be considered in reaching this determination.
 - b. A determination of a "consistent failure to perform" will not be made unless the Owner is satisfied after review of the bidder's prior experience that the Contractor has repeatedly failed to satisfy his obligations under past contracts. For purposes of this clause, "consistent" will not be construed to mean in every contract, nor will it be construed to include "isolated instances" of failure to perform.
 - c. In reaching any determination of this nature, the Owner may consider statements of other parties to the prior unperformed contracts, as well as the representations of the Contractor on his "Bidder Qualification" form. However, in each instance, the Owner will advise the Contractor of such other statements considered before a determination that the bidder is not qualified, as made by the Owner.
- C. The bidder's representations concerning his qualifications will be construed as a covenant under the contract. Should it appear that the bidder has made a material misrepresentation on his "Bidder Qualification" form, the Owner shall have the right to terminate the contract for the Contractor's breach, and the Owner may then pursue such remedies as exist elsewhere under this contract, or as otherwise are provided at law or equity.
- D. A determination that a bidder is unqualified will be made by the Owner. Such determination will be made in writing and include a thorough discussion of why the bidder is deemed unqualified. A letter will be sent to the bidder deemed unqualified, stating the reasons for such determination, and the bidder's right to request a review of this determination by appeal to the Anchorage School District Board.

- E. Any bidder who is deemed to be unqualified may, as provided under existing Anchorage School District policy, appeal such determination to the Anchorage School District Board prior to contract award to another bidder.

1.12 RECEIPT AND OPENING OF BIDS

- A. Time of Opening:

Bids shall be submitted prior to the time specified in the Invitation to Bid, and the exact date and time of receipt of bids will be recorded. Late bids will not be considered, but will be held unopened until the time of award and then returned to the bidder, unless other disposition is requested or agreed to by the bidder. Time of bid receipt will be determined by the time stamp at the Purchasing Department, 4919 Van Buren Street, Anchorage, Alaska 99517.

- B. FAX/Telegraph/Telephonic/E-Mail Bids:

FAX/telegraphic/telephonic/e-mail bids will not be considered. Modification by FAX or telegraph of bids already submitted will be considered if received prior to the time fixed in the Invitation to Bid. FAX/telegraphic modifications shall not reveal the amount of the original or revised bid.

- C. Officer's Responsibility:

No responsibility will attach to any officer or agent of the Owner for the premature opening of, or the failure to open a bid not properly addressed and identified.

1.13 WITHDRAWAL OF BIDS

- A. Bids may be withdrawn on written request received from the bidders prior to the time specified for opening.
- B. No bid shall be withdrawn for a period of ninety (90) days subsequent to the bid opening without the written consent of the Owner.

1.14 BIDDERS INTERESTED IN MORE THAN ONE BID

- A. If more than one bid is offered by any party, by or in the name of his clerk, partner, or other person, all such bids will be rejected. A party who has quoted prices to a bidder is not thereby disqualified from quoting prices to other bidders, or from submitting a bid directly for the work.

1.15 BIDDERS PRESENT

- A. At the time and place specified for the opening of bids, contents of the bids will be made public for the information of bidders and other parties.

1.16 REJECTION OF BIDS

- A. The Owner reserves the right to reject any or all bids, and to waive any informalities or irregularities in bidding or award of the contract.

1.17 AWARD OF CONTRACT

A. Acceptance of Bid:

Following the opening and evaluation of bids, the Owner will determine the apparent low responsive bidder and, subject to its right under Paragraph 1.16 to reject all bids, decide whether to accept the apparent low responsive bid. The Owner's acceptance of the apparent low responsive bid will be through a written notice from a duly authorized representative of the Owner, and no other act of the Owner or its representative will constitute an acceptance of a bid. The notice shall be titled "Notice of Intent to Award Contract," and shall set forth pre-award procedures and requirements, if any, including procedures for approval and award of contract by the School Board.

B. Basis of Award

1. It is the Owner's intention to award a contract to the lowest responsive and responsible bidder, including alternates, base bid, and quantified unit prices accepted by the Owner at the time of award, if applicable.
2. Unit prices which are not quantified will not be included in the determination of the award.
3. The Owner reserves the right to award the alternates in any combination with the base bid and include them in the total award.
4. The District reserves the right to request the lowest bidder(s) whose bids are determined to be reasonably susceptible to award to review their previous bids with consideration of any additions, clarifications or modifications, submit revised bids for Best and Final Offers (bids). If Best and Final Offers are requested, selected offerors must submit revised bids on the forms provided by the District to be considered for evaluation and award. Bidders who do not submit a Best and Final Offers (revised bids), when requested, will not be considered for evaluation and award and their bids will be rejected and considered non-responsive.
 - a. For purposes of this ITB, bids that are "reasonably susceptible to award" means the three (3) lowest responsive and responsible bidders, unless, in the sole discretion of the District's Purchasing Senior Director, one or more of the three lowest responsive and responsible bidder(s) was not within the competitive range and to remain under consideration for award when evaluated with other bids or the District received one or more additional bids that are within the competitive range of the three lowest responsive and responsible bids such that the additional bid(s) may remain under consideration when evaluated with the other bids. This is a strict mathematical evaluation and may not be challenged on that basis except in the case of obvious arithmetic errors.

C. Notification of Award to Bidders:

Following opening of bids and determination of the apparent low responsive bidder, the Administration will make public in the Purchasing Contracting Office each Notice of Intent to Award ten (10) calendar days prior to the scheduled award by the Board, except for purchases under \$100,000 which is three (3) business days. Bidders may, upon request to the Purchasing Office and/or Purchasing Contracting Office, review the bid tabulation summary prior to the scheduled Board award date.

D. Amount of Contract

The amount of the contract shall be understood to be the lump sum as given in the bid form. Where prices are given on alternative items, only the amounts of the alternates accepted by the Owner will be included in the total.

E. Execution of Contract:

By the Contractor: The bidder whose bid is accepted shall execute the contract and furnish the required bonding and insurance within five (5) days after presentation of the contract for signature. The contract shall be deemed to be executed by the successful bidder when two (2) originals of the contract, signed by an authorized officer of the corporation or company, and with each separately signed the bonds and insurances required herein, are received by the Owner. Failure or neglect to execute the contract, within the time specified or such extended period, if any, that the Owner may, in its sole discretion, authorize, shall constitute a breach of the agreement affecting the acceptance of the bid. The damages to the Owner for such a breach shall include loss from interference with the general Capital Improvements Program of the Owner, and other items whose accurate amount would be difficult or impossible to compute.

The amount of the bid guarantee of the successful bidder who fails or neglects to execute the contract after proper notification of the acceptance of the bid shall be retained by the Owner as liquidated damages for such breach.

By the Owner: Upon receipt of the above-referenced two (2) Contracts executed by the Contractor, including all required bonds and insurance certificates, the properly authorized Owner representatives will execute the documents within ten (10) days. The contract shall be deemed to be completely executed when two (2) copies thereof, accompanied by the required bond, liability and other necessary insurance and signed by the Contractor, are executed by the Owner. All awards shall comply with the Anchorage School District Purchasing and Contracting Policy 3311. Awards of \$500,000 or more shall be presented to the School Board for their approval.

1.18 PERFORMANCE BOND AND PAYMENT BOND

- A. The successful bidder will furnish a Performance Bond and a Payment Bond in accordance with Section 00700, Paragraph 7.5.

1.19 INSURANCE

- A. The successful bidder will furnish complete Certificates of Insurance, as required by the General Conditions and Supplementary Conditions, in a form acceptable to the Owner.

1.20 NOTICE TO PROCEED

- A. The Owner will issue a Notice to Proceed with the work within ten (10) days following the Owner's execution of the contract. The date of commencement of the work shall be the date established in the Notice to Proceed. The Owner will not be responsible for any costs incurred by the Contractor prior to the Notice to Proceed.

1.21 AGGRIEVED BIDDERS

A. Protest:

1. An interested party may protest a solicitation or a proposed award of a contract.
 - a. A protest as to the specifications and/or terms and conditions of a solicitation must be received by the Purchasing Senior Director at least five (5) calendar days prior to the due date of the bid or proposal; failure to protest as provided herein constitutes a waiver of any objection to the solicitation.
 - b. For construction projects and architectural/engineering design services, the protest of a proposed award of a contract must be received by the Purchasing Senior Director within ten (10) calendar days after issuance of the notice of intent to award, except that for purchases under \$100,000, the protest must be received within three (3) business days.
 - c. For goods or services, the protest of a proposed award of a contract must be received by the Purchasing Senior Director within seven (7) calendar days after issuance of the notice of intent to award, except that for purchases under \$100,000, the protest must be received within three (3) business days.
 - d. The protest must include the name of the person submitting the protest, the name of the bidder/proposer represented by that person, the specific action or bid/request for proposal contract award which is being protested, a detailed explanation of the reasons for the protest, and the relief requested.
 - e. The aggrieved person must serve all other interested parties with its protest.
2. The Purchasing Senior Director shall stay the intended award of a contract unless the Purchasing Senior Director determines the award of the contract without further delay is necessary to protect the District's best interest.
3. The Purchasing Senior Director may, in his/her sole discretion, hold a hearing.
4. The rights and remedies granted by this section are not available for informal small purchases with an actual or potential value of less than twenty-five thousand dollars (\$25,000).
5. Failure to protest as provided herein constitutes a waiver of any objection to the solicitation and contract award.

B. Appeal:

1. A decision by the Purchasing Senior Director may be appealed to the Anchorage School Board.
2. Any appeal shall be filed with the Superintendent within five (5) days after the decision is received by the protester and must include the name of the person

submitting the appeal, the name of the bidder/proposer represented by that person, and a detailed explanation of the basis for the appeal.

3. The aggrieved bidder/proposer must serve all other interested parties with its appeal.
4. The Superintendent may obtain an independent review of the appeal issues if the Superintendent determines such review will assist consideration of the appeal.
5. The independent review shall be conducted by a not directly involved District employee or an experienced but disinterested third party from outside the District.
6. Failure to appeal to the Anchorage School Board as provided herein constitutes a waiver of any objections to the solicitation and the contract award.

C. Consideration of Appeal:

1. The decision being appealed and the findings from the independent review, if any, will be reported to the Board.
2. Upon consideration of the appeal and allowing interested parties an opportunity to address the issues on appeal, the Board may:
 - a. Award the contract as recommended, if applicable, indicating its reasons for rejecting the appeal;
 - b. Grant the appeal, indicating its reasons for granting the appeal, and determine an appropriate remedy consistent with AR3311.1(c).1 of Board Policy. The Board may award the contract at that meeting to some other bidder/proposer if it finds that a delay in making the award would adversely affect the District;
 - c. Stay any award of the contract to permit further consideration of the appeal, with action to be scheduled as soon as practicable, but in no event more than twenty (20) days after the stay as initiated;
 - d. Reject all bids/proposals.
 - e. Take such other action as appears appropriate and in the best interest of the District under the circumstances.

D. Frivolous Protests:

1. **Signature on Protest Constitutes Certificate**
The signature of an attorney or party on a request for review, protest, motion, or other document constitutes a certificate by the signer that the signer has read the document, to the best of his/her knowledge, information, and belief formed after reasonable inquiry it is well grounded in fact and is warranted by existing law or a good faith argument for the extension, modification, or reversal of existing law, and that it is not interposed for an improper purpose, such as to harass, limit competition, or to cause unnecessary delay or needless increase in the cost of the procurement or of the litigation.

2. Sanctions for Violation

If a request for review, protest, pleading, motion, or other document is filed with the Purchasing Senior Director is signed in violation of Board Policy AR3311.1(c).1, the Board, may impose upon the person who signed it, a represented party, or both, an appropriate sanction, that may include an order to pay to the other party or parties the amount of the reasonable expenses incurred because of the filing of the protest, pleading, motion, or other paper, including a reasonable attorney's fee.

1.22 GUARANTEE SECTION

- A. Whether or not there appears here or elsewhere herein specific reference to guarantees of all items of material, equipment or workmanship, they nevertheless shall be so guaranteed against defects for which the Contractor is responsible that may develop or become evident within a period of one (1) year from and after final acceptance of the work by the Owner. This guarantee shall be understood to imply prompt attention to any remedy of such defects as those mentioned above if and as they occur after the Contractor shall have written notice of their existence. If the defect, in the opinion of the Owner, is of such nature as to demand immediate repair, the Owner shall have the right to make them and the cost thereof shall be borne by the Contractor.

1.23 SUBCONTRACTORS

- A. All subcontractors proposed for the work must be acceptable to the Owner.
- B. The Owner reserves the right to request the proposed subcontractors to complete qualification forms and/or current financial statements prepared by a Certified Public Accountant.

1.24 MINIMUM WAGE RATES

- A. Labor required for the construction of this project is subject to the minimum wage rates as provided in the General Requirements.

1.25 NON DISCRIMINATION

- A. No bidder/offeror on any District contract may illegally discriminate on the basis of sex, race, color, religion, gender identity, sexual orientation, national origin, ancestry, age, marital status, changes in marital status, pregnancy, parenthood, physical or mental disability, Vietnam era veteran status, genetic information, or good faith reporting to the board on a matter of public concern in employment, provision of services, or otherwise.
- B. Any bidder/offeror submitting a bid or proposal of one hundred thousand (\$100,000) or more must certify that if awarded a contract on the basis of that bid or proposal, he/she as the contractor will not illegally discriminate against any member or applicant for employment because of sex, race, color, religion, gender identity, sexual orientation, national origin, ancestry, age, marital status, changes in marital status, pregnancy, parenthood, physical or mental disability, Vietnam era veteran status, genetic information,

or good faith reporting to the board on a matter of public concern in employment, provision of services, or otherwise.

1. Notice of Compliance

- a. All successful bidders/offerors shall insure such non-discrimination.
- b. All successful bidders/offerors must agree to post in conspicuous places, available to employees and applicants for employment, notice setting forth the provisions of this non-discrimination section and this section shall be deemed to be a part of every contract entered into by the District under these policies.

2. Minority Business Enterprises

- a. The District requires adherence to the Anchorage Municipal Code, relating to Minority Business Enterprises and will monitor and implement these policies through the District's Equal Employment Opportunity Director (EEO).
- b. It is the policy of the District that socially and economically disadvantaged minority businesses located within the Municipality of Anchorage be afforded an equitable opportunity to participate in District contracts.
- c. Any appeal from a decision of the Equal Employment Opportunity Director shall be to the Superintendent and, if not satisfied, to the Board.

1.26 ASBESTOS FREE MATERIALS

- A. The bidder, by submitting a bid on this project, thereby certifies and guarantees to the Anchorage School District that any products or materials sold, used or installed under the terms of this contract will not contain any asbestos. In the event the product sold does not conform to the above standards, the buyer may return the product for correction or replacement at the seller's option and at the seller's expense. Services performed by the seller which do not conform to the above standards must be corrected by the seller at the seller's expense or make the appropriate correction within a reasonable time.

1.27 CONFLICT OF INTEREST

- A. The Contractor agrees to certify that Anchorage School District employees, School Board members, or a member of their household are not in conflict of interest with the contract and Board Policy as follows (AR3311.1(e).1 Disclosure and Waiver of Conflict of Interest):
 1. No Board member, employee, or a member of their household, shall acquire, directly or indirectly, an economic interest in a District or Municipal contract, or engage in business with the District or the municipality, unless the contract is competitively solicited and other requirements of Section 3311 of Board Policy and section 1.15 of the Anchorage Municipal Code are met.
 2. The following acts and circumstances shall not be deemed to be in conflict with the performance of official duties if, at the earliest opportunity after having acquired such knowledge, the Board member or employee files a disclosure pursuant to AR3311.1(e).1 or requests and obtains a waiver pursuant to Board Policy AR3311.1(e).2:

- a. Such person owns a sole proprietorship, or is a partner in a partnership, or is an officer, director, major shareholder (five percent (5%) or more of the outstanding shares) or has management control in a corporation that submits a bid, proposal or quotation to the District or attempts to enter or enters into a contract with the District;
 - b. Such person has any significant (five percent (5%) or more) financial interest in any sale, lease or rental to the District of any service or property and such person has knowledge that the District intends to purchase, lease or rent the property or service;
 - c. Such person wishes to sell or receive royalties on books or materials sold to the District for use in the school system for which the employee is the author;
 - d. Such person is an employee who has been providing private services to a child who transfers to a new school or class or advances to a higher grade and the child becomes a student in the class being taught/aided by his/her provider.
- B. Board Members, District employees, and their household and/or immediate family members are required to comply with Board Policies and the Municipal Ethics Code by disclosing conflicts of interest.
- 1. When a board member, employee, or their household and/or immediate family member intends to do business with the District, the appropriate District and Municipal forms must be filed by the Board Member or District employee with the Municipal Clerk's Office and the Purchasing Department.
- Note: *Notice of Intent To Respond To Public Solicitation* shall be filed with the Municipal Clerk's office in advance to allow a minimum of **7 calendar days to elapse between electronic publication by the clerk and the final date** for submitting a response to the solicitation. The form may be obtained from the Municipality of Anchorage website, www.muni.org.

District *Disclosure* and *Request for Waiver* forms and instructions may be obtained from the Purchasing Bid Information link under Quick Links on the ASD website, www.asdk12.org.
- 2. The responsibility for complete and timely filing rests solely with the Board Member or District employee.
- C. Copies of all conflict of interest and ethics code documents should be submitted with your quote.

1.28 CONTRACT INDUCEMENTS

- A. No payment, gratuity or offer of employment shall be made in connection with any contract, by or on behalf of the subcontractor to the prime contractor or higher tier subcontractor or any person associated therewith, as an inducement for the award of a subcontract or order.

1.29 GOVERNANCE

- A. This solicitation is an Invitation to Bid (“ITB”) governed by applicable Anchorage School Board Policies, including Section 3311 of such Policies. Anchorage School Board Policies are available at <https://www.boardpolicyonline.com/?b=anchorage>

Offerors should read this ITB carefully and review all instructions contained herein. Incomplete or incorrect bids may be rejected as not conforming to the essential requirements of the ITB. Bids submitted on other than the prescribed forms contained in this ITB will be rejected. Bidders may copy the forms contained in the ITB for use in their bids, but substitute forms or formats are unacceptable. Electronic copies of the forms which bidders must submit as part of any bid, if any—if not provided with this ITB—may be obtained by contacting the Anchorage School District Purchasing Department. Forms shall not be altered except to supply requested bidder information.

1.30 APPRENTICESHIP UTILIZATION COMPLIANCE

- A. In order to be deemed a responsive bid/offer, bidders/offerors shall provide a signed notarized Apprenticeship Utilization Affidavit (“AUA”) with their bid. ASD reserves the right to request the signed notarized AUA to be submitted within three (3) working days after bid submission. By doing this, bidders/offerors are confirming that they understand and agree that in all trades/crafts categories in which there is an Alaskan Federally Registered Apprenticeship Program, they will ensure that 15% of the aggregate hours in those trades’ categories will be worked by apprentices, as mandated by Anchorage School Board Policy 3311.1.2. This applies to both prime contractor labor hours and subcontractor labor hours. By signing the AUA, bidders/offerors are confirming their understanding and agreement that ASD will request documentation to factually demonstrate compliance with the 15% Apprenticeship Utilization Policy (“AUP”), and conduct audits. Audits for smaller projects will be conducted every 30 days, larger projects will be audited every 90 days. In addition to providing documentation to ASD to confirm that 15% of the labor hours worked in trades/crafts categories that have Alaskan Federally Registered Apprenticeship Program has been done by certified apprentices enrolled in such programs, the prime contractor will provide documentation to confirm that the apprentices listed on the documentation submitted are currently in good standing in their Alaskan Federally Registered Apprenticeship Program. Attached to the solicitation will be the current version of the Federally Registered Alaskan Apprenticeship Programs, which was provided to ASD by the Federal Department of Labor.
- B. Forms used to demonstrate compliance during the contract administration period are found in Section 00630 Construction Forms.
1. List of Federally Registered Alaskan Apprenticeship Programs
 - a. This list from the Federal Department of Labor will provide contractors with a list of Alaskan apprenticeship programs and crafts/trades categories that are subject to ASD’s AUP.
 2. Apprenticeship Utilization Form
 - a. The Prime Contractor will list the crafts/trades categories required to complete the project that have Alaskan Federally Registered Apprenticeship Programs. This list will include all crafts/trades categories for both the prime and subcontractors.

3. Apprenticeship Utilization Program Calculation Form

- a. This form will be submitted by the prime contractors to demonstrate compliance with the apprenticeship utilization percentage for both prime and subcontractors on the project.
- b. Audits will be performed when the hours submitted by the prime's and/or subcontractor's certified payroll exceed 500 hours. Audits will continue as per the schedule unless the prime's and the subcontractor's certified payroll does not meet the minimum threshold of 500 hours. Prime and Subcontractors will be required to submit certified payrolls during periods where very little work is being performed. This will continue until the minimum threshold of 500 hours is met and warrants an audit. Audits will be conducted from Site Available to Contractors through Final Completion on all projects awarded by the District in excess of \$100,000 at the time of bid.

4. Penalty Table

- a. This table lists the penalties for non-compliance with the AUP.

- C. Prime Contractors are required to meet with Purchasing to discuss forms and processes of Apprentice Utilization Program prior to start of work.

END OF SECTION

PROJECT SCHEDULE MILESTONE DATES

Division 0
Section 00200

PROJECT SCHEDULE MILESTONE DATES

On-Site Visit	March 12, 2024
Pre-bid Conference	March 13, 2024
Second On-Site Visit	March 18, 2024
Bid Opening	March 27, 2024
Board Meeting (anticipated)	April 23, 2024 Non-Action, May 7, 2024 Action
Notice to Proceed (anticipated)	May 21, 2024
Site Available to Contractor	May 28, 2024
Substantial Completion – Building	August 9, 2024
Final Completion	October 31, 2025

Dates of Interest:

Spring Break Week	March 11 – 15, 2024
School Ends for Students	May 22, 2024
Teachers Last Day	May 23, 2024
Memorial Day	May 27, 2024
Juneteenth	June 19, 2024
Independence Day Holiday	July 4, 2024
Teachers First Day	August 12, 2024
Students First Day	August 15, 2024
Labor Day	September 2, 2024
Indigenous Peoples Day	October 14, 2024
Parent Teacher Conferences	October 23 – 24, 2024
Thanksgiving Holiday	November 28 – 29, 2024
Winter Vacation	December 23, 2024 – January 3, 2025
School Ends for Students (2025)	May 21, 2025
Teachers Last Day (2025)	May 22, 2025
Teachers First Day (2025)	August 11, 2025
Students First Day (2025)	August 14, 2025

The Contractor shall be required to plan, schedule, execute and complete all work under the contract in accordance with the Project Schedule Milestone Dates set forth under this Section 00200. The above listed Project Schedule Milestone Dates for Substantial Completion and Final Completion may not be altered by the Contractor, either to schedule or to achieve early completion of the project, without the express written consent of the Owner.

The bidder's attention is drawn to the requirements of Division 1, Section 01311 of the General Requirements entitled Project Schedule and to the Phasing Drawings for associated phasing information.

END OF SECTION

Project Title: Spring Hill ES Roof Replacement

Invitation to Bid Number: 2024 – 813

TO: Anchorage School District
4919 Van Buren Street
Anchorage, Alaska 99517

FROM: _____ BIDDER

ADDRESS

CITY/STATE

PHONE/FAX

EMAIL

Operating as (strike out conditions that do not apply) an individual, a company, a corporation, organized and existing under the laws of the State of _____, or a proprietorship, a partnership, or joint venture consisting of _____.

1. BASE BID:

Having become completely familiar with the local conditions affecting the cost of the work at the place where work is to be executed, and having carefully examined the site and building conditions as they currently exist, and having carefully examined the proposed contract documents, together with any addenda to such contract documents as listed hereinafter, the undersigned hereby proposes and agrees to provide all labor, materials, equipment, transportation, supervision and other facilities as necessary and/or required to execute all of the work described by the aforesaid contract documents for the lump sum consideration of:

\$ _____ (In Numbers)

Said amount being hereinafter referred to as the base bid, base bid proposed, or lump sum.

2. ALTERNATES:

The undersigned proposes to perform alternates for the stated resulting additions or deductions from the base bid. Additions and deductions shall include any modifications of work or additional work that the undersigned may deem to be required to perform by reason of the acceptance or rejection of any alternate, including allowances for overhead and profit, and in accordance with the Project Schedule Milestone Dates set forth under Section 00200 hereof. The Owner reserves the right to award the alternates in any order or number and include them in the contract award price.

A. Alternate Number One: Provide and install new cameras and all work associated with them instead of reinstallation of existing.

Adjust Base Bid by ADDING: \$ _____ (In Numbers)

3. UNIT PRICES:

The following unit prices will be used at the discretion of the Owner for the addition or deletion of work not reasonably implied or not included in the Contract Documents. Unit prices must include all labor, material, overhead, and profit for each unit of work. All unit price work will be processed by Request for Proposal followed by a Change Order to the Contract when quantities are verified and agreed upon.

A. None

4. ALLOWANCES / ASSIGNMENTS:

A. Siemens Building Technologies: \$TBD

5. ADDENDA ACKNOWLEDGMENT:

The undersigned acknowledges receipt of the following addenda: (List by number and date appearing on addenda.)

6. TIME OF COMPLETION:

The undersigned agrees to complete all work under this contract in accordance with the Project Schedule Milestone Dates set forth under Section 00200 hereof.

7. BID SECURITY:

A bid bond in the amount of five percent (5%) of the total amount of the base bid is attached in the sum of:

\$ _____ (In Numbers)

which is to become the property of the Owner in the event the Performance Bond and Payment Bond are not executed within the time set forth in paragraph 10 of this section, as liquidated damages for the delay and additional work caused the Owner.

8. The undersigned agrees that upon receipt of the notice of acceptance of his bid, he will execute the formal contract, and will deliver all proper bonds and proof of insurance coverage as may be required by the contract documents.

9. The undersigned agrees to accept the Assignment of the Bid Allowance as set forth in Section 01031, Bid Allowances.

10. The undersigned further agrees to execute the formal contract within ten (10) days from the date of the notice of acceptance of this bid, and in case the undersigned fails or neglects to appear within the specified time to execute the contract, the undersigned will be considered as having abandoned the contract, and the bid bond accompanying this bid will be forfeited to the Owner by

reason of such failure on the part of the undersigned.

11. The undersigned further agrees to commence with the work under the contract in accordance with the date of commencement of the Work established in the Notice to Proceed.
12. The undersigned further agrees that the bid security may be retained by the Owner and that said bid guarantee shall remain with the Owner until the contract has been executed by the Owner.
13. The undersigned has checked all of the above figures, and understands that the Owner will not be responsible for any errors or omissions on the part of the undersigned in preparing this bid.
14. In submitting this bid, it is understood that the right is reserved by the Owner to reject any or all bids and waive any informalities and irregularities in connection therewith. It is agreed that this bid may not be withdrawn for a period of forty-five (45) days from the date and time of opening.
15. The undersigned declares that the person or persons signing this Bid Form is/are fully authorized to sign on behalf of the firm listed and to fully bind the firm listed to all the conditions and provisions thereof.
16. It is agreed that no person or persons or company other than the firm listed below or as otherwise indicated has any interest whatsoever in this bid or the contract that may be entered into as a result of the bid and that in all respects the proposal is legal and firm, submitted in good faith without collusion for fraud.
17. It is agreed that the undersigned has complied or will comply with all requirements of local, state and national laws, and that no legal requirement has been or will be violated in making or accepting this bid in awarding the contract to him and/or in the prosecution of the work required.
18. CONFLICT OF INTEREST:

I certify no member of the School Board or District employee, or spouse or other member of his/her household shall have any undisclosed interest as noted in paragraph entitled Conflict Of Interest (Section 00100). By and for the bidder:

Signature: _____

19. APPRENTICESHIP UTILIZATION AFFIDAVIT (FOR BIDS OVER \$100,000)

Pursuant to School Board Policy 3311.1.2, Use of Apprentices, I _____

the undersigned Principal for _____

on Solicitation _____ certify:

- A. I understand that Anchorage School District (“ASD”) School Board Policy 3311.1.2 states, “For capital maintenance and construction projects with an estimated total cost of more than \$100,000, the Anchorage School District shall require that no less than fifteen percent (15%) of the total hours worked on the project shall be performed by apprentices enrolled in a federally registered or State of Alaska-approved apprenticeship program. This requirement shall only apply to crafts for which an Alaskan federally registered apprenticeship program exists.”
- B. I will ensure that apprentices employed by the prime and sub-contractors, in the eligible trades categories, will provide no less than fifteen percent (15%) of the aggregate labor hours of those eligible trades categories.
- C. I understand that if awarded a contract, ASD will audit the prime contractor at 30-day intervals for contracts from \$100,001 to \$5,000,000 and 90-day intervals for contracts exceeding \$5,000,000 and ASD reserves the right to audit at random intervals as needed.
- D. I understand ASD will conduct random site inspections to determine that employed apprentices are working at the project site.
- E. I understand that if I am awarded a contract ASD will require the following specific reporting requirements during the contract performance period to ensure that the 15% apprenticeship utilization requirement is met:
 - a. List of the apprentices the prime contractor intends to use to meet the utilization goal, and the Alaskan federally registered apprenticeship programs to which they belong (Apprenticeship Utilization Form);
 - b. List of the subcontractors that the prime contractor will use on this project;
 - c. List of the apprentices the subcontractor intends to use to meet the utilization goal required by the prime contractor, and the apprenticeship programs they belong to (Apprenticeship Utilization Form);
 - d. Submission of Apprenticeship Utilization Program Calculations Form, to be submitted by the prime contractor, at 30-day intervals for contracts from \$100,001 to \$5,000,000 and 90-day intervals for contracts exceeding \$5,000,000, consisting of a compliance spreadsheet, with supporting documents demonstrating compliance by both the prime contractor and all subcontractors, identifying the trades categories that are subject to the utilization requirement, apprentice employees used to meet the goals, and apprentice hours calculation showing compliance with the required 15% utilization when compared to total hours worked in the eligible trades categories.
- F. I understand a non-compliance penalty for projects from \$100,001 to \$5,000,000 will be assessed at each 30-day audit per the Penalty Table, if I am found to be non-compliant during the contract period.
 - a. Failure to comply at 1st 30-day audit will result in a penalty per the Penalty Table, which will be deducted from the prime contractor’s invoice.
 - b. Failure to comply in a consecutive 2nd 30-day audit will result in a penalty per the Penalty Table, which will be deducted from the prime contractor’s invoice.
 - c. Failure to comply in a consecutive 3rd 30-day audit will result in a penalty per the Penalty Table, which will be deducted from the prime contractor’s invoice.

- d. Failure to comply in a consecutive 4th 30-day audit will result in a penalty per the Penalty Table, which will be deducted from the prime contractor's invoice, and may result in a finding of non-responsibility on future bidding. (This penalty will repeat for any future non-compliance.)
- G. I understand a penalty for projects exceeding \$5,000,000 will be assessed at each 90-day audit, if I am found to be non-compliant during the contract period.
- a. Failure to comply at 1st 90-day audit will result in a penalty per the Penalty Table, which will be deducted from the prime contractor's invoice.
 - b. Failure to comply in a consecutive 2nd 90-day audit will result in a penalty per the Penalty Table, which will be deducted from the prime contractor's invoice.
 - c. Failure to comply in a consecutive 3rd 90-day audit will result in a penalty per the Penalty Table, which will be deducted from the prime contractor's invoice.
 - d. Failure to comply in a consecutive 4th 90-day audit will result in a penalty per the Penalty Table, which will be deducted from the prime contractor's invoice, and may result in a finding of non-responsibility on future bidding. (This penalty will repeat for any future non-compliance.)
- H. Application of the Penalty Table:
- a. Advancement of penalties in the Penalty Table will only be assessed for consecutive non-compliance. If the contractor gets back into compliance, any future non-compliance will be assessed at the beginning step of the Penalty Table, per the applicable contract threshold category.
- I. Lack of Apprentice(s) availability:
- a. If a contractor is awarded a contract but cannot meet the apprenticeship utilization requirement, and fail an audit, the contractor will have the opportunity to request a waiver from the apprenticeship utilization requirement. A waiver will only be granted if the contractor can factually demonstrate that the cause was from a lack of available apprentices in eligible trades categories.
- J. ASD will provide the List of Alaskan Federal Registered Apprenticeship Programs, which contains the crafts/trades categories within those federally registered programs. Once per year, ASD will receive the updated List of Alaskan Federal Registered Apprenticeship Programs from the Federal Department of Labor to capture any new Alaskan Federally Registered Apprenticeship Programs that have been added, or to capture any that have been dissolved or discontinued. The List of Alaskan Federal Registered Apprenticeship Programs provided to ASD by the Federal Department of Labor will be posted on ASD's website, as contained in the solicitation, so contractors have access to it.
- K. Definitions:
- a. **Alaskan Federally Registered Apprenticeship Programs** are programs approved by the Federal Department of Labor, US DOL Office of Apprenticeship.
 - b. **Eligible Trades Categories** are the crafts/trades categories that fall under an Alaskan Federally Registered Apprenticeship Program. Eligible Trades Categories will be the categories measured for aggregate project hours and apprentice hours to establish the apprenticeship utilization percentage.
 - c. **The List of Alaskan Federal Registered Apprenticeship Programs** is a current list provided by ASD to contractors that shows the Alaskan Federally Registered Apprenticeship Programs and the eligible trades categories under those programs. That current list will be the list in effect and in force during the issuance of the solicitation. Any changes to the list will affect future solicitations and will not be retroactive to prior solicitations.
 - d. **Random Site Inspections** are defined as non-scheduled site inspections, in which ASD's representative will visit the project site to establish if apprentices are physically

on-site. ASD will provide a minimum of 24 hours' notice to contractors prior to the site inspections.

- e. **Consecutive Non-Compliance** is when a contractor consecutively fails to meet the required apprenticeship utilization percentage. If a contractor fails an audit, but then passes the next audit, any future non-compliance will be addressed at the first step of the Penalty Table per the contract values in the table.
- f. **The Measurement of Aggregate Apprenticeship Utilization Hours** is defined by the following. Compliance will be audited at 30-day intervals for projects from \$100, 001 to \$5,000,000, and 90-day intervals for projects over \$5, 000,000. Each 30 or 90 day audit period will be measured independently for aggregate apprenticeship utilization hours. If a contractor does not meet the 15% apprenticeship utilization requirement in an audit period, a penalty will be assessed, per the penalty table. However, the deficiency in percentage of apprenticeship utilization hours, will not be carried forward from one audit period to the next. Contractors will only be required to meet the 15% apprenticeship utilization requirement in each audit period, which will be measured independently. In addition, if the aggregate hours for all audit periods for the entire project are 15% or greater, any previously assessed penalties for non-compliance in an audit period will be rescinded.
- g. **Finding of non-responsibility:** If ASD determines a contractor to be non-responsible, they will not be permitted to bid on ASD projects.

IN WITNESS WHEREOF, the signature of the undersigned Contractor has been hereunto set this

_____ day of _____, 20____, at _____, Alaska.

Signature: _____

Printed Name: _____

I, _____, being first duly sworn, say that I am the agent for and executed the foregoing under authority of said company to do so; that I have read the same, know the contents thereof, and the matter set forth therein are as I truly believe.

Signature: _____

Subscribed and sworn to before me this _____ day of _____, 20____, at _____, Alaska.

Notary Public in and for: _____

My Commission Expires: _____.

20. LICENSE NUMBER(S):

Alaska Business License Number: _____

Alaska General or Specialty Contracting License Number: _____

Respectfully Submitted, this _____ day of _____, 20__.

Firm Name: _____

Federal Tax ID: _____

Address: _____

Signature: _____

Name (Typed): _____

Title: _____

CORPORATE SEAL

ENCLOSURES:

1. Bid Guarantee (in the form and amount specified or required, include Power of Attorney For Surety)

END OF SECTION

ASBESTOS ABATEMENT SUBCONTRACTOR'S CERTIFICATE OF INSURANCE

Division 0
Section 00420

ASBESTOS ABATEMENT SUBCONTRACTOR'S CERTIFICATE OF INSURANCE

PART 1. GENERAL

1.01 REFERENCE:

- A. As part of the Owner-Contractor Agreement (Document 00500), the Contractor shall cause its asbestos abatement subcontractor to submit a Certificate of Insurance on an Anchorage School District Form on which the Subcontractor's insurer certifies that the Subcontractor has insurance coverage to the same extent, with the same endorsements, and with the same limits and under the same conditions as those required of the Contractor pursuant to General Conditions of the Owner-Contractor Agreement, Article 11, with the exception of builder's risk insurance and umbrella liability insurance. The Contractor shall submit to the Owner the Subcontractor's completed Certificate of Insurance within five (5) days after the Owner's approval of the proposed Asbestos Abatement Subcontractor.

PART 2. (NOT USED)

PART 3. (NOT USED)

END OF SECTION

OWNER – CONTRACTOR AGREEMENT FORM

REFERENCE:

1. The form of agreement between the Owner and the Contractor shall be the form bound herein.
2. The Agreement shall be executed in duplicate.

CONTRACT NO. XXCXXXX
SCHOOL PROJECT TITLE
ITB 202X-8XX
ASD PROJECT NO. XXXXXX

Board Memo No.: N/A or NumberDate of Contract: Date of Contract

Company
Address
City, State, Zip

- Sole Proprietorship
 Partnership
 Incorporated in the State of Alaska

OWNER: ANCHORAGE SCHOOL DISTRICT, ANCHORAGE ALASKA

CONTRACT FOR: ITB SCHOOL PROJECT TITLEAmount of Contract: Amount of Contract in words Dollars and No Cents

Base Bid:	<u>\$xxx,xxx.xx</u>
Additive Alternate 1:	<u>\$xxx,xxx.xx</u>
Siemens Allowance:	<u>\$xxx,xxx.xx</u>
Total:	<u>\$xxx,xxx.xx</u>

Statement of Work: The Contractor shall furnish all labor, equipment and materials and perform the work above described for the amount stated in strict accordance with Contract Documents, all of which are made a part of this Contract and designated as follows:

CONTRACT DOCUMENTS

- I. This Contract, consisting of two (2) pages.
- II. Section 00620 Performance Bond and Payment Bond, consisting of nine (9) pages, dated (date of contract) and attached Power of Attorney for Surety.
- III. Contractor signed Bid Form, Section 00300 and signed Addendum/a consisting of four (4) or five (5) pages.
- IV. Alaska Sex Offender/Child Kidnapper Registry Contractor Certification consisting of one (1) page.
- V. Certificates of Insurance.
- VI. Invitation to Bid (number) Project Manual dated (date) and all Drawings are hereby incorporated by reference as if in full text.

In the event of a conflict between any of the Contract Documents and the provisions of any purchase order of materials or service request issued in connection with this Contract, the provisions of the Contract Documents shall prevail.

Work shall be started in accordance with the Notice to Proceed. Time being of the essence, work shall be completed in accordance with the Project Schedule Milestone Dates set forth under Section 00200 thereof.

The ASD Project Manager for this Contract is: Insert Name of Project Manager Cell (907) XXX-XXXX, Office (907) XXX-XXXX and insert email address.

The attached performance and payment bond is in due form according to law, and is hereby approved.

Anchorage School District Attorney

Date: _____

IN WITNESS WHEREOF, the parties hereto have executed this Contract as of this date entered on the first page hereof.

ANCHORAGE SCHOOL DISTRICT

CONTRACTOR BUSINESS NAME

David Whiting, Date
Senior Director of Purchasing/Warehouse

Contractor Signature Date

Contractor Print Name and Title

Corporate Seal

Account Code(s):

END OF CONTRACT

END OF SECTION

BID BOND FORM

REFERENCE:

1. If the Bid Guarantee is submitted on Bond Form, the Bid Bond shall be the form as bound herein.

BID BOND

KNOW ALL MEN BY THESE PRESENT that we, _____ as
Contractor

PRINCIPAL, and _____, a corporation duly organized under the laws
Surety

of the State of _____, as SURETY/OBLIGOR authorized to transact surety business in the state of Alaska, are held and firmly bound unto the ANCHORAGE SCHOOL DISTRICT, as OBLIGEE, in the amount of 5% of the Base Bid Amount for payment whereof PRINCIPAL and SURETY bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these present.

WHEREAS, the PRINCIPAL is herewith submitting its proposal for _____

The condition of this obligation is such that if the PRINCIPAL will, within the time required, enter into a formal contract, and give a good and sufficient bond to secure the performance of the terms and conditions of the contract, then this Obligation to be void; otherwise, the PRINCIPAL and SURETY will pay unto the OBLIGEE the amount stated above.

OWNER

Anchorage School District
4919 Van Buren Street
Anchorage, Alaska 99517

CONSTRUCTION PROJECT

Solicitation No.: _____

Location: _____

CONTRACTOR

Name: _____

Address: _____

City/State: _____

SURETY

Name: _____

Address: _____

City/State: _____

IN TESTIMONY WHEREOF, the parties hereunto have caused the execution of this bond on the _____
day of _____, 20____.

PRINCIPAL

SURETY

Contractor Name

Corporate Surety Name (Seal)

By: _____
Signature

By: _____
Signature

Typed Name and Title

Typed Name, Attorney-in-fact

WITNESS AS TO PRINCIPAL

Note: Attach Power of Attorney for Surety Signator.

END OF SECTION

PERFORMANCE BOND AND PAYMENT BOND

REFERENCE:

1. The Performance Bond and Payment Bond shall be the forms as bound herein.

CONSTRUCTION PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENT that we, _____ as
Contractor

PRINCIPAL, and _____, a corporation duly organized under the laws
Surety

of the State of _____, as SURETY/OBLIGOR authorized to transact surety business in the
state of Alaska, are held and firmly bound unto the ANCHORAGE SCHOOL DISTRICT, as OBLIGEE, in
the amount

of _____
_____ Dollars

(\$ _____), for payment whereof PRINCIPAL and SURETY bind ourselves, our heirs,
executors, administrators, successors and assigns, jointly and severally, firmly by these present.

This Construction Performance Bond ("Bond") is entered into by and between the undersigned parties to
ensure the faithful performance of the Construction Contract listed below.

OWNER

Anchorage School District
4919 Van Buren Street
Anchorage, Alaska 99517

CONSTRUCTION PROJECT

Solicitation No.: _____
Location: _____

BOND

Number: _____
Date: _____
Amount: _____

CONSTRUCTION CONTRACT

Number: _____
Date: _____
Amount: _____

CONTRACTOR

Name: _____
Address: _____
City/State: _____

SURETY

Name: _____
Address: _____
City/State: _____

IN TESTIMONY WHEREOF, the parties hereunto have caused the execution hereof of two (2) original counterparts as the _____ day of _____, 20_____.

PRINCIPAL

Contractor Name

Signature

Typed Name and Title

SURETY

Corporate Surety Name (Seal)

Signature

Typed Name, Attorney-in-fact

WITNESS AS TO PRINCIPAL

Note: Attach Power of Attorney for Surety Signator.

CONSTRUCTION PERFORMANCE BOND TERMS AND CONDITIONS

1. The CONTRACTOR and the SURETY, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the OWNER for the complete and proper performance of the Construction Contract, which is incorporated herein by reference.
2. If the CONTRACTOR completely and properly performs all of its obligations under the Construction Contract, the SURETY and the CONTRACTOR shall have no obligation under this Bond.
3. If there is no OWNER Default, the SURETY's obligation under this Bond shall arise after:
 - a. OWNER has declared a CONTRACTOR Default under the Construction Contract pursuant to the terms of the Construction Contract; and
 - b. The OWNER has agreed to pay the Balance of the Contract Sum to:
 - i. The SURETY in accordance with the terms of this Bond and the Construction Contract; or
 - ii. A contractor selected to perform the Construction Contract in accordance with the terms of this Bond and the Construction Contract.
4. When the OWNER has satisfied the conditions of Paragraph 3, the SURETY shall promptly (within thirty (30) days) and at the SURETY's expense elect to take one of the following actions:
 - a. Arrange for the CONTRACTOR, with consent of the OWNER, to perform and complete the Construction Contract (but OWNER may withhold consent, in which case the SURETY must election option 4b, 4c or 4d, below); or
 - b. Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or
 - c. Obtain bids from qualified contractors acceptable to OWNER for a contract for performance and completion of the Construction Contract, and, upon determination by OWNER of the lowest responsive and responsible bidder, arrange for a contract to be prepared for execution by OWNER and the contractor selected with OWNER's concurrence, to be secured with performance and payment bonds executed by a qualified SURETY equivalent to the bonds issued on the Construction Contract; and, if the SURETY's obligations defined in Paragraph 6 exceed the Balance of the Contract Sum, then the SURETY shall pay to OWNER the amount of such excess; or
 - d. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and, with reasonable promptness under the circumstances and after investigation and consultation with OWNER, determine in good faith the amount for which it may then be liable to OWNER under Paragraph 6 for the performance and completion of the Construction Contract and, as soon as practicable after the amount is determined, tender payment therefore to OWNER with full explanation of the payment's calculation. If OWNER accepts the SURETY's tender under this paragraph 4.d, OWNER may still hold SURETY liable for future damages then unknown or unliquidated resulting from the CONTRACTOR Default. If OWNER disputes the amount of the SURETY's tender under this paragraph 4.d, OWNER may exercise all remedies available to it at law to enforce the SURETY's liability under paragraph 6.

5. If the SURETY does not proceed as provided in Paragraph 4, then the SURETY shall be deemed to be in default on this Bond ten (10) days after receipt of an additional written notice from OWNER to the SURETY demanding that the SURETY perform its obligations under this Bond. At all times OWNER shall be entitled to enforce any remedy available to OWNER at law or under the Construction Contract including, without limitation, and by way of example only, rights to perform work, protect work, mitigate damages, or coordinate work with other consultants or contractors.
6. The SURETY's monetary obligation under this Bond is limited by the amount of this Bond. Subject to these limits, the SURETY's obligations under this Bond are commensurate with the obligations of the CONTRACTOR under the Construction Contract. The SURETY's obligations shall include but are not limited to:
 - a. The responsibilities of the CONTRACTOR under the Construction Contract for completion of the Construction Contract and correction of defective work;
 - b. The responsibilities of the CONTRACTOR under the Construction Contract to pay liquidated damages, and for damages for which no liquidated damages are specified in the Construction Contract, actual damages caused by non-performance of the Construction Contract, including but not limited to, all valid and proper back charges, offsets, payments, indemnities or other damages;
 - c. Additional legal, design professional and delay costs resulting from the CONTRACTOR Default or resulting from the actions or failure to act of the SURETY under Paragraph 4.
7. No right of action shall accrue on this Bond to any person or entity other than OWNER or its heirs, executors, administrators, or successors.
8. The SURETY hereby waives notice of any change, alteration or addition to the Construction Contract or to related subcontracts, purchase orders and other obligations, including changes of time. The SURETY consents to all terms of the Construction Contract, including provisions on changes to the Contract. No extension of time, change, alteration, modification, deletion, or addition to the Contract Documents, or of the work required thereunder, shall release or exonerate SURETY on this Bond or in any way affect the obligations of SURETY on this Bond.
9. Any proceeding, legal or equitable, under the Bond shall be instituted in the Superior Court for the State of Alaska, Third Judicial District.
10. Notice to the SURETY, OWNER or the CONTRACTOR shall be mailed or delivered to the address shown on the front page.
11. Any provision in this Bond conflicting with any statutory or regulatory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein.
12. Definitions.
 - a. Balance of the Contract Sum: The total amount payable by OWNER to the CONTRACTOR pursuant to the terms of the Construction Contract after all proper adjustments have been made under the Construction Contract, for example, deductions for progress payments made, and increases/decreases for approved modifications to the Construction Contract.
 - b. Construction Contract: The agreement between OWNER and the CONTRACTOR identified on the signature page, including all Contract Documents and changes thereto.

PERFORMANCE BOND AND PAYMENT BOND

Division 0

Section 00620

- c. CONTRACTOR Default: Material failure of the CONTRACTOR which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract, including but not limited to, the provisions of Article 14 of the General Conditions of the Construction Contract.
- d. OWNER Default: Material failure of OWNER, which has neither been remedied nor waived, to pay the CONTRACTOR progress payments due under the Construction Contract or to perform other material terms of the Construction Contract, if such failure is the cause of the asserted CONTRACTOR Default and is sufficient to justify CONTRACTOR termination of the Construction Contract.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENT that we, _____ as
Contractor

PRINCIPAL, and _____ a corporation duly organized under the laws
Surety

of the State of _____, as SURETY/OBLIGOR authorized to transact surety business in the
state of Alaska, are held and firmly bound unto the ANCHORAGE SCHOOL DISTRICT, as OBLIGEE, in
the amount

of _____ Dollars

(\$ _____), for payment whereof PRINCIPAL and SURETY bind ourselves, our heirs,
executors, administrators, successors and assigns, jointly and severally, firmly by these present.

This Payment Bond ("Bond") is entered into by and between the undersigned parties to ensure the faithful
performance of the Construction Contract listed below.

OWNER

Anchorage School District
4919 Van Buren Street
Anchorage, Alaska 99517

CONSTRUCTION PROJECT

Solicitation No.: _____
Location: _____

BOND

Number: _____
Date: _____
Amount: _____

CONSTRUCTION CONTRACT

Number: _____
Date: _____
Amount: _____

CONTRACTOR

Name: _____
Address: _____
City/State: _____

SURETY

Name: _____
Address: _____
City/State: _____

PERFORMANCE BOND AND PAYMENT BOND

Division 0
Section 00620

IN TESTIMONY WHEREOF, the parties hereunto have caused the execution hereof of two (2)
original counterparts as the _____ day of _____, 20_____.

PRINCIPAL

Contractor Name

Signature

Typed Name and Title

SURETY

Corporate Surety Name (Seal)

Signature

Typed Name, Attorney-in-fact

WITNESS AS TO PRINCIPAL

Note: Attach Power of Attorney for Surety Signator.

PAYMENT BOND TERMS AND CONDITIONS

The condition of this obligation is such that if the PRINCIPAL shall promptly make payment to all Claimants who furnish labor or materials in the prosecution of the Work provided for in the Construction Contract, then this obligation shall be void; otherwise, it shall remain in full force and effect.

This Bond has been furnished to comply with Alaska Statute 36.25.010, and to allow enforcement rights pursuant to Alaska Statute 36.25.020. Any provisions in this Bond conflicting with said statutory requirements shall be deemed deleted herefrom and provisions conforming to such statutory requirements shall be deemed incorporated herein.

The SURETY hereby waives notice of any change, alteration or addition to the Construction Contract or to related subcontracts, purchase orders and other obligations, including changes of time. The SURETY consents to all terms of the Construction Contract, including provisions on changes to the Contract. No extension of time, change, alteration, modification, deletion, or addition to the Contract Documents, or of the work required thereunder, shall release or exonerate SURETY on this Bond or in any way affect the obligations of SURETY on this Bond.

END OF SECTION

SAMPLE FORMS AND CERTIFICATES

A.GENERAL

A.01 RELATED WORK SPECIFIED ELSEWHERE

- A. Comply with the contract conditions requirements and specified administrative procedures in closing-out work.

A.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Section 01700: Project Close-out
- B. General and Supplementary General Conditions

A.03 APPLICATION AND CERTIFICATE FOR PAYMENT

- A. Use Anchorage School District Form 100, 100A, 100B, and 100C attached herein.

A.04 CERTIFICATION OF SUBSTANTIAL COMPLETION

- A. Use Anchorage School District Form 101 attached herein.

A.05 CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS

- A. Use Anchorage School District Form 102 attached herein.

A.06 RELEASE ON CONTRACTS

- A. Use Anchorage School District Form 103 attached herein.

A.07 CONSENT OF SURETY COMPANY TO FINAL PAYMENT

- A. Use Anchorage School District Form 104 attached herein.

A.08 CONSENT OF SURETY TO REDUCTION IN OR PARTIAL RELEASE OF RETAINAGE

- A. Use Anchorage School District Form 105 attached herein.

A.09 CERTIFICATES OF INSURANCE

- A. The contractor's Certificate of Insurance shall be on an industry standard form with, as a minimum, the categories and clauses on the Accord form with contractual clauses for contract number and description, subrogation waiver, additional insured and cancellation notification.

A.10 REQUEST FOR INFORMATION

- A. Contractor's requests for information shall be on Anchorage School District request for information forms.

A.11 PRIME CONTRACT POTENTIAL CHANGE ORDER (PCO)

A. Proposals will be executed on Anchorage School District PCO forms.

A.12 CERTIFICATE OF COMPLIANCE

A. The Contractor shall submit a notarized Certificate of Compliance, contained in this section, with his application for Final Payment.

A.13 WARRANTY OF WORK

A. The Contractor shall furnish to the Owner a notarized Warranty of Work after Final Payment, contained in this section, with his application for Final Payment.

A.14 AHERA EXCLUSION DOCUMENT

A. The Contractor shall furnish to the Owner a signed AHERA Exclusion Document, contained in this section, with his application for Final Payment.

A.15 PRIME CONTRACT CHANGE ORDER (PCCO)

A. Change Orders/Contract Modifications will be executed on Anchorage School District PCCO forms.

A.16 CONTRACTOR'S QUALITY CONTROL REPORT (CQC)

A. The Contractor shall complete the CQC Report in accordance with Section 01400.

A.17 DEPARTMENT OF LABOR NOTICE OF WORK

A. The Contractor shall furnish to the Department of Labor a Notice of Work prior to start of construction.

A.18 DEPARTMENT OF REVENUE TAX CLEARANCE REQUEST FORM

A. For projects funded through the Department of Education (debt reimbursement or DEED grants), the Contractor shall furnish to the Owner a Tax Clearance Request Form approved by the Department of Revenue, contained in this section, with his application for Final Payment.

A.19 DEPARTMENT OF LABOR TAX CLEARANCE REQUEST FORM

A. For projects funded through the Department of Education (debt reimbursement or DEED grants), the Contractor shall furnish to the Owner a Tax Clearance Request Form approved by the Department of Labor, contained in this section, with his application for Final Payment.

A.20 SUBMITTAL CONTROL FORM

A. Submittals will be executed on Anchorage School District Submittal Control Forms.

A.21 STATE OF ALASKA SEX OFFENDER/CHILD KIDNAPPER REGISTRY CONTRACTOR CERTIFICATION

A. Contractor certifies contractor is familiar with and is in compliance with Anchorage School Board Policy 3515.5, that no employee or agent of contractor who will be on district property

is registered as a sex offender or child kidnapper in Alaska [Alaska Department of Public Safety “Sex Offender/Child Kidnapper Registry”] or in any other state in which the employee or agent previously lived or worked, and that, to contractors knowledge, no employee or agent is a convicted sex offender or child kidnapper.

A.22 STATE OF ALASKA SEX OFFENDER/CHILD KIDNAPPER REGISTRY SUBCONTRACTOR CERTIFICATION

A. Subcontractor certifies subcontractor is familiar with and is in compliance with Anchorage School Board Policy 3515.5, that no employee or agent of subcontractor who will be on district property is registered as a sex offender or child kidnapper in Alaska [Alaska Department of Public Safety “Sex Offender/Child Kidnapper Registry”] or in any other state in which the employee or agent previously lived or worked, and that, to subcontractors knowledge, no employee or agent is a convicted sex offender or child kidnapper.

A.23 STATE OF ALASKA SEX OFFENDER/CHILD KIDNAPPER REGISTRY SUB-SUBCONTRACTOR CERTIFICATION

A. Sub-subcontractor certifies sub-subcontractor is familiar with and is in compliance with Anchorage School Board Policy 3515.5, that no employee or agent of sub-subcontractor who will be on district property is registered as a sex offender or child kidnapper in Alaska [Alaska Department of Public Safety “Sex Offender/Child Kidnapper Registry”] or in any other state in which the employee or agent previously lived or worked, and that, to sub-subcontractors knowledge, no employee or agent is a convicted sex offender or child kidnapper.

A.24 LIST OF FEDERALLY REGISTERED ALASKAN APPRENTICESHIP PROGRAMS

A. This list from the Federal Department of Labor will provide contractors with the list Alaskan apprenticeship programs and crafts/trades categories that are subject to ASD’s AUP.

A.25 APPRENTICESHIP UTILIZATION FORM

A. The Prime Contractor will list the crafts/trades categories required to complete the project that have Alaskan Federally Registered Apprenticeship Programs. This list will include all crafts/trades categories for both the prime and subcontractors.

A.26 APPRENTICESHIP UTILIZATION PROGRAM CALCULATION FROM

A. This form will be submitted by the prime contractors to demonstrate compliance with the apprenticeship utilization percentage for both prime and subcontractors on the project.

A.27 PENALTY TABLE

A. This table lists the penalties for non-compliance with the AUP.

ANCHORAGE SCHOOL DISTRICT APPLICATION FOR PAYMENT	
Project Name: ITB/RFP No.: Name of Contractor: Address:	Contract #: Application #: Application date: Period to:
COMPUTATION OF PAYMENT DUE	
(a) Original contract amount (ASD 100A)	\$ -
(b) Net Change by Change Orders (ASD 100B)	\$0.00
(c) Adjusted contract amount to date (a+b)	-
(d) Work Completed to Date (ASD 100B)	-
(e) Materials Stored (ASD 100B)	-
(f) Total Completed and Stored To Date (d+e)	-
(g) Less: amount retained in accordance with contract terms	-
(h) Net amount earned on contract work to date (f-g)	-
(i) Less: amount of previous payments (ASD 100B)	\$0.00
(j) CURRENT PAYMENT DUE (h-i)	\$ -
(k) Balance to Finish (c-h)	\$ -
CERTIFICATION OF CONTRACTOR	
According to the best of my knowledge and belief, I certify that all items and amounts shown on the face of this Application for Payment are correct; that all work has been performed and/or material supplied in full accordance with the requirements of the referenced Contract, and/or duly authorized deviations, substitutions, alterations, and/or additions; that payment has been made for all materials received and work performed for which previous pay applications were approved; that no part of the "Balance Due This Payment" has been received and that it is currently due.	
_____ (Contractor)	By _____ (Signature of Authorized Representative)
_____ Date	_____ Title
CERTIFICATION OF ARCHITECT	
According to the best of my knowledge and belief, and based on on-site observations, I certify that the work completed as shown on ASD 100B has progressed as indicated, the quality of work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the Current Payment Due shown above.	
_____ Date	_____ (Signature of Architect)
APPROVED FOR PAYMENT	
_____ Date	_____ (ASD Project Manager)

ASD 100 (1/15)

CERTIFICATE OF SUBSTANTIAL COMPLETION

Project: _____ Contract Number: _____

Contractor: _____ Contract Date: _____

Architect: _____ Date of Issuance: _____

Owner: ANCHORAGE SCHOOL DISTRICT
1301 Labar Street
Anchorage, Alaska 99515

Project Description:

The work performed under this contract has been reviewed and found to be substantially complete. The date of Substantial Completion is hereby established as: _____

Definition of Date of Substantial Completion:

The date of substantial completion of the project is the date certified by the Owner when the work is substantially complete in accordance with, and defined in the Contract Documents.

A list of items to be completed or corrected, prepared by the Owner and verified and amended by the Architect is appended hereto. The failure to include any items or such list does not alter the responsibility of the Contractor to complete the project in accordance with the Contract Documents.

The Contractor will complete or correct the work on the list of items appended hereto within 30 days from the date of substantial completion.

The responsibilities of the Owner and the Contractor for maintenance, heat, utilities, and insurance shall be as follows: _____

In reliance upon the certification of the Contractor and the Architect, the Owner hereby accepts the project as substantially complete. In accordance with the Contract Documents, the Owner hereby elects to assume occupancy of _____

_____ at _____ a.m./p.m. on
_____.

Owner: **ANCHORAGE SCHOOL DISTRICT**

By: _____ Title: _____ Date: _____

Architect: _____

By: _____ Title: _____ Date: _____

Contractor: _____

By: _____ Title: _____ Date: _____

ASD 101 (01/03)

**CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS
ANCHORAGE SCHOOL DISTRICT**

WHEREAS, by the terms of a contract dated _____ entered into by the
Anchorage School District, and _____ for the construction of

The undersigned, pursuant to the General Conditions of the Contract for the construction,
_____, hereby certifies that, except as listed below, he has paid
in full or has otherwise satisfied all obligations for all materials and equipment furnished, for all work, labor, and services
performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in
connection with the performance of the Contract referenced above for which the District or his property might in any way
be held responsible.

EXCEPTIONS:

IN WITNESS WHEREOF, the seal of the undersigned Contractor have been hereunto set this

day of

, at

By

being first duly sworn, say that I am the agent for and executed
the foregoing under authority of said company to do so; that I have read the same, know the contents thereof, and the
matters set forth therein are as I truly believe.

By

Subscribed and sworn to before me this _____ day of

, at

Notary Public in and for _____

My Commission Expires _____

RELEASE ON CONTRACT
ANCHORAGE SCHOOL DISTRICT

WHEREAS, by the terms of a contract dated _____ entered into by the Anchorage School District, and _____ for the construction of

it is provided that:

"Neither the final payment nor the remaining retained percentage shall become due until the Contractor shall provide the Owner (1) with a waiver and release of liens, on the forms provided by the Owner, executed by the Contractor..."

NOW THEREFORE, in consideration of the premises and the payment by the Anchorage School District to the undersigned Contractor of the amounts due under the contract and any changes or modifications thereto, to wit, the sum

of \$ _____ Dollars,
(Numbers) (In Words)

the undersigned Contractor hereby releases and forever discharges the Anchorage School District including its property, particularly that real property known as the

of the Anchorage School District, of and from all manner of debts, dues and sum or sums of money, accounts, claims, and demands whatsoever, in Law and in equity, under or by virtue of said contract, and warrants good title to all material, supplies and equipment installed or incorporated in the project and all work delivered to the premises, together with all improvements and appurtenances constructed thereon by:

_____ to the Anchorage School District free of any claims, liens or encumbrances. Neither the undersigned nor any person, firm or corporation furnishing material or labor for any work covered by this Contract has any right to a lien upon the premises nor improvement thereon, except:

—

IN WITNESS WHEREOF, the signature of the undersigned Contractor has been hereunto set this

_____ day of _____, 20____, at _____, Alaska.

Signature: _____

Printed Name: _____

I, _____, being first duly sworn, say that I am the agent for and executed the foregoing under authority of said company to do so; that I have read the same, know the contents thereof, and the matters set forth therein are as I truly believe.

Signature: _____

Subscribed and sworn to before me this _____ day of _____, 20____, at _____, Alaska.

Notary Public in and for _____

My Commission Expires: _____.

CONSENT OF SURETY COMPANY
TO FINAL PAYMENT

PROJECT: _____

PROJECT NUMBER: _____

CONTRACTOR: _____

CONTRACT DATE: _____

TO: Anchorage School District

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above:

_____ (Surety Company)

on bond of

_____ (Contractor)

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety Company of any of its obligations to Anchorage School District, Owner as set forth in said Surety Company's bond. Surety expressly agrees that any and all valid claims of sub-Contractors and all persons supplying labor or materials to the project will be satisfied by Contractor or Surety in a timely manner

IN WITNESS WHEREOF, the Surety Company has hereunto set its hand this

_____ day of _____, 20__.

Name of Surety Company

Attest

Signature of Authorized Representative

Title

**CONSENT OF SURETY TO REDUCTION IN OR PARTIAL RELEASE OF RETAINAGE
ANCHORAGE SCHOOL DISTRICT**

PROJECT:

PROJECT NUMBER:

TO: Anchorage School District

CONTRACT DATE:

CONTRACTOR:

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above,
the:

_____ (Surety Company)

on bond of

_____ (Contractor)

HEREBY APPROVES OF THE REDUCTION IN OR PARTIAL RELEASE OF RETAINAGE to the Contractor
as follows:

The surety agrees that such reduction in or partial release of retainage to the Contractor shall not relieve the
Surety of any of its obligations to **ANCHORAGE SCHOOL DISTRICT, OWNER**

IN WITNESS WHEREOF, the Surety Company has hereunto set its hand this
day of .

Name of Surety Company

Attest

Signature of Authorized Representative

Title

ASDF Form 105

IMPORTANT

If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

DISCLAIMER

This Certificate of Insurance does not constitute a contract between the issuing insurer(s), authorized representative or producer, and the certificate holder, nor does it affirmatively or negatively amend, extend or alter the coverage afforded by the policies listed thereon.

ACORD 25 (2009/01)

Anchorage School District

REQUEST FOR INFORMATION

Facilities Maintenance
1301 Labar Street
Anchorage, Alaska 99515

Phone: (907) 348-5215
Fax: (907) 348-5227

No.

TITLE:

DATE:

PROJECT:

Project No.:

TO:

REQUEST:

ANSWER:

Answered By:

Printed Name

Signature

Date

This is not an authorization to proceed with any work involving additional cost and / or time.
Notification must be given in accordance with Contract Documents if any clarification, variation or Architects/Engineers responses cause any change to the Contract Documents.

ANCHORAGE SCHOOL DISTRICT USE ONLY:

Is this Request for Information associated with an Request for Proposal?

Reviewed By:

Yes ___ No ___

Signed:

Project Manager

Date:

Request for Proposal #



Capital Planning & Construction
 1301 Labar St
 Anchorage, Alaska 99515
 Phone: (907) 348-5284
 Fax: (907) 348-5227

Project:

PCO #XXX

Prime Contract Potential Change Order #XXX: Name

TO:	FROM:
PCO NUMBER/REVISION:	CONTRACT:
REQUEST RECEIVED FROM:	CREATED BY:
STATUS:	CREATED DATE:
REFERENCE:	PRIME CONTRACT CHANGE ORDER:
FIELD CHANGE:	CHANGE ORDER REQUEST:
LOCATION:	ACCOUNTING METHOD:
SCHEDULE IMPACT:	PAID IN FULL:
CHANGE REASON:	TOTAL AMOUNT:

Within seven (7) days, submit an itemized proposal.

Provide labor, material, equipment, and supervision necessary to complete changes to project as represented by the documentation indicated below. The quoted price shall include all direct and indirect costs (additive and deductive) associated with and resulting from this work, per the General Conditions of the Contract. Provide lump sum proposal properly itemized and supported by sustaining data to permit evaluation. The quoted price shall be considered full compensation and include all delay, impact, and actual cost associated with the resulting changes from this extra work.

POTENTIAL CHANGE ORDER DESCRIPTION: *(The Contract Is Changed As Follows)*

ATTACHMENTS:

APPROVAL

By: _____	Date _____	By: _____	Date _____
Project Manager		Contractor	
By: _____		By: _____	
Construction Supervisor		Senior Director of CP&C	
Date: _____	Required if amount exceeds \$10,000	Date: _____	Required if amount exceeds \$50,000

CERTIFICATE OF COMPLIANCE

No final payment shall be made until the Contractor shall file with the Owner, prior to acceptance of the work, a notarized Certification of Compliance in the following form:

The Contractor does hereby certify that all work has been performed and materials supplied in accordance with the Drawings, Specifications and Contract Documents for the above work, and that:

No less than the prevailing rates of wages as ascertained by the governing body of the Contracting Agency has been paid to laborers, workmen and mechanics employed on this work;

There have been no unauthorized substitutions of Subcontractors; nor have any subcontracts been entered into without prior notice having been submitted to the Owner prior to the start of such subcontracted work;

No subcontract was assigned or transferred or performed by any Subcontractor other than the original Subcontractor, without prior notice having been submitted to the Owner together with the names of all Subcontractors;

All claims for material and labor and other paid service performed in connection with these specifications have been paid;

All monies due the State Industrial Accident Fund, the State Unemployment Compensation Trust Fund, the State Tax Commission, Hospital Associations and/or others have been paid.

In WITNESS WHEREOF, the undersigned has signed and sealed this instrument this

_____ day of _____, 20__.

(Firm Name)

(Signature)

(Title)

(Attest)

(SEAL IF BIDDER IS A CORPORATION)

As determined necessary, evidence of compliance may be required to be submitted with and made a part of this Certificate of Compliance.

WARRANTY OF WORK

Prior to Final Payment, the Contractor shall furnish to the Owner a Warranty of Work in the following form:

The Contractor does hereby warrant all work and materials to be in full and complete accordance with the Contract Documents and Agreement between Owner and Contractor, and requirements appertaining thereto; that all work and materials are free from any and all defects and imperfections, and fully suitable for the use and purposes for which each and every part is intended. The Contractor also agrees that, should any defect develop or appear which the Project Manager or Owner's Representative finds was Not caused by improper use, the Contractor shall promptly, upon demand, fully correct, substitute and make good any such defective material without any cost to the Owner and will save the Owner harmless against any claim, demand, loss or damage by reason of any breach of this warranty.

The period of this warranty shall commence on the date of Substantial Completion.

The warranty shall continue to be in full force and effect for the period of one (1) year, except for those items for which a longer period of warranty is specifically stated in the Warranties for work in Technical Sections of the Specifications.

Warranties for work stated in Technical Section shall continue in full force and effect for the respective periods expressly stated.

In WITNESS WHERE, the undersigned has signed and sealed this instrument this

_____ day of _____, 20__.

(Firm Name)

(Signature)

(Title)

(Attest)

(SEAL IF BIDDER IS A CORPORATION)

AHERA Exclusion Document

Contractor's Verification of Asbestos-Free Construction

Project: _____ Project Number: _____

Contractor: _____ Date: _____

To: Anchorage School District
Facilities Coordinator,
AHERA LEA Designated Person

To the best of our knowledge, no asbestos-containing building materials were installed in this project.

Attest: _____
Signature of Authorized Representative

Title



Capital Planning & Construction
 1301 Labor St
 Anchorage, Alaska 99515
 Phone: (907) 348-6264
 Fax: (907) 348-6227

PCCO #XXX

Project:

Prime Contract Change Order #XXX:

TO:	FROM:
DATE CREATED:	CREATED BY:
CONTRACT STATUS:	REVISION:
DESIGNATED REVIEWER:	REVIEWED BY:
DUE DATE:	REVIEW DATE:
CONTRACTUAL COMPLETION DATE:	
SCHEDULE IMPACT:	EXECUTED:
CONTRACT FOR:	TOTAL AMOUNT:
DESCRIPTION:	
ATTACHMENTS:	

CHANGE ORDER REQUESTS IN THIS CHANGE ORDER:

COR #	Issue	Description	Cost
TOTAL:			\$ 0.00

CHANGE ORDER LINE ITEMS: reason

Original contract sum	\$
Previously authorized change orders	\$
Previous contract amount	\$
Current change order amount	\$
New contract sum	\$
Percent of original contract sum	

Contractor _____ DATE _____

Senior Director of Purchasing/Warehouse _____ DATE _____

SAMPLE FORMS AND CERTIFICATES

Division 0
Section 00630

CONTRACTOR'S QUALITY CONTROL REPORT (CQC)		DATE	REPORT NO.
CONTRACT NO. AND NAME OF CONTRACTOR		DESCRIPTION AND LOCATION OF THE WORK:	
WEATHER CLASSIFICATION:			CLASSIFICATION:
CLASS A	No interruption of any kind from weather conditions occurring on this or previous shifts.	CLASS _____	
CLASS B	Weather occurred during this shift that caused a complete stoppage of all work.	TEMPERATURE:	
CLASS C	Weather occurred during this shift that caused a partial stoppage of work.	MAX _____ MIN _____	
CLASS D	Weather overhead excellent or suitable during shift. Work completely stopped due to results of previous adverse weather.	PRECIPITATION:	
CLASS E	Weather overhead excellent or suitable during shift but work partially stopped due to previous adverse manner.	INCHES _____	
OTHER	Explain.		
CONTRACTOR/SUBCONTRACTORS AND AREA OF RESPONSIBILITY FOR WORK PERFORMED TODAY: (Attach list of items of equipment either idle or working as appropriate.)			
a. _____			
b. _____			
c. _____			
d. _____			
e. _____			
f. _____			
g. _____			
h. _____			
1. WORK PERFORMED TODAY: (Indicate location and description of work performed. Refer to work performed by prime and/or subcontractors by letter in Table above.)			
2. TYPE AND RESULTS OF INSPECTION: (Indicate whether P-Preparatory, I-Initial, or F-Follow-up and include satisfactory work completed or deficiencies with action to be taken.)			

3. TESTS REQUIRED BY PLANS AND/OR SPECIFICATIONS PERFORMED AND RESULTS OF TESTS:
4. QUALITY CONTROL REPORTS (items requiring special inspections):
5. VERBAL INSTRUCTIONS RECEIVED: (List any instructions given by Owner on construction deficiencies, retesting required, etc., with action to be taken.)
6. REMARKS: (Cover any conflicts in plans, specification or instructions: acceptability of incoming materials; offsite surveillance activities; progress of work, delays, causes and extent thereof; days of no work with reasons for same.)
CONTRACTOR'S CERTIFICATION: I certify that the above report is complete and correct and that all material and equipment used, work performed and tests conducted during this reporting period were in strict compliance with the contract plans and specifications except as noted above. <p style="text-align: right;">_____ CONTRACTOR'S APPROVED AUTHORIZED REPRESENTATIVE</p>

Department of Labor and Workforce Development
Labor Standards and Safety Division
Wage and Hour Administration
www.labor.state.ak.us/lss/lss.htm

- This form must be typed or printed in ink.
- Fill in all blanks or form will be returned for correction (see back).
- Please allow a minimum of 10 working days for processing.

ENTER YOUR FAX # _____ AND LIST YOUR MAILING ADDRESS BELOW

Contractor, company or agency name, address, city, state & ZIP + 4

NOTICE OF WORK

Filing Fee Required

Project name	
Specific site description	
Contract awarding agency	
Address	
City	State ZIP + 4
Contract awarding agency contact person	Phone #
Location and city where work is to be performed	
Date work to begin (m/d/y)	Do you intend to use subcontractors? <input type="checkbox"/> Yes <input type="checkbox"/> No
Final Bid Date	Contract #

Primary contractor (has contract with the public agency)		
List all contractors & subcontractors (Attach extra sheet if necessary)	Type of work	Amount of subcontract

CERTIFICATION: I hereby certify that the above information is correct. Enclosed is the filing fee computed at 1% of the total amount of all my subcontractors on this project. This amount includes the contract value for the primary contractor. I understand that the maximum fee I am required to pay is \$5,000. I further certify that all contractors shall be made aware of the requirements of AS 36.05.010 - .110 and AS 36.10.007 - .990 before working.

Total value of subcontracts	\$
	+
Value of work performed by primary contractor	\$
Amount subject to fee	\$
	Multiply by .01
Total fee enclosed =	\$
ROUND FEES TO NEAREST DOLLAR	

Signature	Date
Title	
Fax #	Phone #

For Dept. Use Only

Accepted:
By _____ Department of Labor and Workforce Development

For Dept. Use Only

Amount: _____ Check Number: _____ Cash _____
Received By: _____ Date: _____
Credit Card Confirmation _____
Visa _____ MC _____
Project Name _____
DOLWD Project # _____

Wage & Hour date-stamped copy of this form will serve as temporary receipt.

How to expedite the processing of your form:

Acceptance of this notice will be based on the information provided by the primary contractor.

ERRORS THAT CAUSE REJECTION

No fee included or incorrect amount. If total contract amount is less than \$25,000 no filing fee is required. Contract amounts paid to owner/operators with no employees are exempt from the fee. **The maximum total filing fee for any one project is \$5,000.00.**

Missing – Enter the “time and materials” if applicable. The exact dollar amount will be required on the Notice of Completion to be filed when the project is done.

Missing – The name of each subcontractor and the amount or estimated amount of the subcontract is required. Enter the “time and materials” if applicable. The exact dollar amount will be required on the Notice of Completion to be filed when the project is done.

Missing – Notice of Work must be signed by an authorized representative.

FILING INSTRUCTIONS

If there is not enough space to list all contractor/subcontractor information, attach additional sheets.

A Wage and Hour Administration (WH) date-stamped copy of this form will serve as a temporary receipt, while the acceptance of fees is processed. WH will mail or fax the accepted copy of this notice to the organization provided on the front of this form. Make a copy for your records. This will serve as your notice that the fees paid have been accepted by WH.

For questions call the nearest WH office:

Juneau: (907) 465-4842 Anchorage: (907) 269-4900 Fairbanks: (907) 451-2886

For more forms, see www.labor.state.ak.us/lss/lssforms.htm

Submit the notice and the appropriate filing fee to:

Alaska Department of Labor and Workforce Development
Wage and Hour Administration
P.O. Box 107021
Anchorage, AK 99510-0721

If no fee is required, you may fax the notice to (907) 269-4915

**Alaska Department of Revenue
TAX CLEARANCE REQUEST FORM**

Applicant's Name: _____

EIN/SSN: _____

Mailing Address: _____

City/State/Zip Code: _____

I hereby authorize the Alaska Department of Revenue to release to

_____ (Name of Department or Agency)

Department's Statute on tax clearance: _____

whose facsimile number or email address is _____

confirmation that all taxes, penalties and interest due the Department of Revenue have been paid and that there are no outstanding amounts due.

Signed: _____

Printed Name: _____

Title*: _____

*If tax clearance is being requested on behalf of a corporation/LLC/partnership, must be signed by an officer/member/partner.

Send completed form by email to the Department of Revenue at DOR.tax.accounting@alaska.gov

<i>DEPARTMENT USE ONLY</i>	
<input type="checkbox"/>	<i>The above applicant is current on all taxes, penalties and interest due and is in good standing with the Alaska Department of Revenue.</i>
<input type="checkbox"/>	<i>The above applicant is not current on all taxes, penalties and interest due and is not in good standing with the Alaska Department of Revenue.</i>
_____ <i>Department of Revenue Representative</i>	_____ <i>Date</i>

TaxClearanceRequestForm (Rev 2/21)



THE STATE of ALASKA GOVERNOR MICHAEL J. DUNLEAVY

Department of Labor and Workforce Development

Division of Employment and Training Services Employment Security Tax

P.O. Box 115509 Juneau, AK 99811-5509 Relay Alaska (In state): (800) 770-8973 or 7.1.1 Relay Alaska (out of state): (800) 770-8255 Toll free: (888) 448-2937 Phone: (907) 465-2787 Fax: (907) 465-2374

Tax Clearance Request Form for Contractors

Date of request: _____

Business name of the contractor a Tax Clearance is being requested for: _____

Business address: _____

Business contact phone number: _____

Federal Identification Number: _____

Alaska Employer Account Number: _____

Specific time period a tax clearance is being requested for (i.e. beginning and ending date of a subcontract agreement): _____

Subcontract project name: _____

Name and address of the person this Tax Clearance is to be returned to: _____

Comments or additional information: _____

For agency use only:

- Tax Clearance is granted
Tax Clearance is not granted (please have employer contact the department)
No account on file, liability unknown (please have employer contact the department)
Employer has stated no employees, Tax Clearance not required.

Agency representative signature: _____ Date: _____

Agency representative title: _____

We are an equal opportunity employer/program. Auxiliary aids and services are available upon request to individuals with disabilities. labor.alaska.gov/estax

Rev. 8/2018

**STATE of ALASKA SEX OFFENDER/CHILD KIDNAPPER
REGISTRY
CONTRACTOR CERTIFICATION**

Pursuant to Article 1, Subparagraph 1.02, of the Instructions to Bidders, Specification Section 00100, I _____ the undersigned Principal for _____ on Solicitation No. _____, certify:

1. that I, either personally or through a person designated by me, have researched the State of Alaska Sex Offender/Child Kidnapper Registry to confirm that no employee or agent who may enter Anchorage School District property in connection with the contract is listed in the Registry.

2. that I have required all subcontractors and any of their sub-subcontractors to certify, or will require all subcontractors and any of their sub-subcontractors to certify, that they researched the State of Alaska Sex Offender/Child Kidnapper Registry to confirm that no employee or agent who may enter district property in connection with the contract is listed in the Registry. I will provide all such certifications to the district on request.

3. To my knowledge, no employee or agent of bidder, or any sub-contractor or sub-sub-contractor of bidder, who may enter district property in connection with the contract is: (a) listed in the sex offender/child kidnapper registry of any other state; or, (b) is a convicted sex offender or child kidnapper.

4. I have read district Board Policy 3515.5 and certify that the bidder will comply with Board Policy 3515.5. The bidder will not send any employee or agent who is a sex offender or child kidnapper to district property, as that term is defined in Board Policy 3515.5.

By: _____
Signature Printed Name

Title: _____

Dated: _____

Revised April 4, 2018

**STATE of ALASKA SEX OFFENDER/CHILD KIDNAPPER
REGISTRY
SUBCONTRACTOR CERTIFICATION**

Pursuant to Article 1, Subparagraph 1.02, of the Instructions to Bidders, Specification Section 00100, I _____ the undersigned Principal for _____ on Solicitation No. _____, certify:

1. that I, either personally or through a person designated by me, have researched the State of Alaska Sex Offender/Child Kidnapper Registry to confirm that no employee or agent who may enter Anchorage School District property in connection with the contract is listed in the Registry.

2. that I have required all subcontractors and any of their sub-subcontractors to certify, or will require all subcontractors and any of their sub-subcontractors to certify, that they researched the State of Alaska Sex Offender/Child Kidnapper Registry to confirm that no employee or agent who may enter district property in connection with the contract is listed in the Registry. I will provide all such certifications to the district on request.

3. that if my company enters into an agreement to perform work as a Subcontractor for _____ the General Contractor for the district under Solicitation No. _____, my company will not allow any worker whose name appears on the State of Alaska Sex Offender/Child Kidnapper Registry to perform work on or at the Project site.

By: _____
Signature Printed Name

Title: _____

Dated: _____

Revised April 21, 2015

**STATE of ALASKA SEX OFFENDER/CHILD KIDNAPPER
REGISTRY
SUB-SUBCONTRACTOR CERTIFICATION**

Pursuant to Article 1, Subparagraph 1.02, of the Instructions to Bidders, Specification Section 00100, I _____ the undersigned Principal for _____ on Solicitation No. _____, certify:

1. that I, either personally or through a person designated by me, have researched the State of Alaska Sex Offender/Child Kidnapper Registry to confirm that no employee or agent who may enter Anchorage School District property in connection with the contract is listed in the Registry.

2. that if my company enters into an agreement to perform work as a Sub-subcontractor for _____ a Subcontractor for the General Contractor for the district under Solicitation No. _____, my company will not allow any worker whose name appears on the State of Alaska Sex Offender/Child Kidnapper Registry to perform work on or at the Project site.

By: _____
Signature Printed Name

Title: _____

Dated: _____

Revised April 21, 2015

ANCHORAGE SCHOOL DISTRICT'S
LIST OF

ALASKAN FEDERALLY REGISTERED APPRENTICESHIP PROGRAMS

Program Number	Program Name	Program Status	Address	Occupation Title
A1000910003	ABC of Alaska, Inc.	Registered	301 Arctic Slope Avenue, Suite 100 ANCHORAGE AK 99518	CARPENTER
A100033002	ALASKA ACQUISICAL	Registered	902 Warren Street KETCHIKAN AK 99901	CARPENTER
A1000550001	Alaska Carpenters Training Trust	Registered	8751 King Street Anchorage AK 99515	CARPENTER
A10001081888	Collins Construction, Incorporated	Suspended	1151 W. Nugget Avenue Wasilla AK 99554	CARPENTER
A1000126897	Finchell Works, LLC	Registered	P.O. Box 523791 Bill Lake AK 99652	CARPENTER
A1000178017	H Construction, LLC	Registered	15381 Teelings Circle Palmer AK 99645	CARPENTER
A1000170010	ICE SERVICES, INCORPORATED	Registered	2606 C-STREET, SUITE 28 ANCHORAGE AK 99503	CARPENTER
A1000081120	WOODWRIGHT Construction, Inc.	Registered	P.O. Box 6235 Ketchikan AK 99901	CARPENTER
A100030009	YUKON-KUSKOKWIM DELTA APPRENTICESHIP PROGRAM	Registered	P.O. BOX 869 BETHEL AK 99559	CARPENTER
A1000550001	Alaska Carpenters Training Trust	Registered	8751 King Street Anchorage AK 99515	CARPENTER, INTERIOR SYSTEMS (Alternate Title: Interior Systems Carpenter)
A1000550001	Alaska Carpenters Training Trust	Registered	8751 King Street Anchorage AK 99515	CARPENTER, PALDRIVER
A1000700017	Alaska Trowel Trades JATC	Registered	825 East 8th Avenue, Suite 10 Anchorage AK 99501	CEMENT MASON
2019-AK-7268	Baldy Concrete Construction, LLC	Registered	P.O. Box 82061 Fairbanks AK 99708	CEMENT MASON
A1001940006	Alaska Laborers JATC	Registered	301 Arctic Slope Avenue, Suite 100 ANCHORAGE AK 99518	CONSTRUCTION CRAFT LABORER
A1000147891	Wolverine Supply, Inc.	Registered	17805 OLD GLENN HWY CHUGIAK AK 99567	CONSTRUCTION CRAFT LABORER
A1000135504	Rock-n-Road Construction, Inc.	Registered	P.O. Box 1188 Petersburg AK 99833	CONSTRUCTION CRAFT LABORER
A1000000007	ALASKA TEAMSTER-EMPLOYER SERVICE TRAINING TRUST	Registered	5099 E. Blue Lupine Drive Wasilla AK 99554	CONSTRUCTION CRAFT LABORER
2017-AK-497	Alter Hours Truck & Fleet	Registered	P.O. Box 128 Emmonak AK 99581	CONSTRUCTION DRIVER
A1000103514	Holland America Princess Alaska - Yukon	Registered	P.O. Box 1188 Petersburg AK 99833	DIESEL MECHANIC
2017-AK-69477	Peak Offfield Service Company - Bristol Bay Industrial	Registered	459 Ocean Dock Road Anchorage AK 99501	DIESEL MECHANIC
A1000102656	RL Trucking, LLC	Registered	5015 Business Park Blvd., Suite 4000 Anchorage AK 99503	DIESEL MECHANIC
2017-AK-469	907 Electric	Registered	1221 East 71st Avenue Anchorage AK 99518	DIESEL MECHANIC
A1000990003	ABC of Alaska, Inc.	Registered	11134 June Agnes Circle Eagle River AK 99577	ELECTRICIAN
A10001080586	Access Electric & General Trades, LLC	Registered	P.O. Box 1761 Seward AK 99654	ELECTRICIAN
A1000146734	Agape Electric	Registered	P.O. Box 670856 Chugiak AK 99567	ELECTRICIAN
A1000167701	ALASKA JOINT ELECTRICAL APPRENTICESHIP & TRAINING TRUST	Registered	P.O. Box 7601 NIKISKI AK 99635	ELECTRICIAN
A1000700015	Alaska Native Tribal Health Consortium, Division of Environmental Health & Engineering	Registered	5800 B ST ANCHORAGE AK 99518	ELECTRICIAN
A1000133542	Alaska's Wiremen	Registered	4500 Diplomat Drive, Suite 454 Anchorage AK 99508	ELECTRICIAN
A1000102776	Ala-Wa, Inc.	Registered	5955 Fox Trail Road Seldovia AK 99669	ELECTRICIAN
A1000145920	Alpine Electric	Registered	P.O. Box 338 Ulaakak AK 99685	ELECTRICIAN
A1000080238	Ampeid Electric, Inc.	Registered	13901 East Mogen Ruelle Court Palmer AK 99645	ELECTRICIAN
A1000104003	ANCHOR ELECTRIC	Registered	3400 International Street Fairbanks AK 99701	ELECTRICIAN
A1000157693	Anderson Brothers Electric, LLC	Registered	5362 COMMERCIAL DRIVE JUNEAU AK 99801	ELECTRICIAN
2019-AK-73630	Arctic Fox Electric, LLC	Registered	16300 Ocean View Drive Juneau AK 99801	ELECTRICIAN
A10001060013	AUKE BAY ELECTRIC	Registered	3251 Eastwind Court Anchorage AK 99516	ELECTRICIAN
A1000104025	BEAR ELECTRIC, INCORPORATED	Registered	P.O. BOX 210194 AUKE BAY AK 99821	ELECTRICIAN
2019-AK-71428	Bering Strats Development Company	Registered	2089 Perkins Drive FAIRBANKS AK 99709	ELECTRICIAN
A1000165915	Boonfig Electric, LLC	Registered	P.O. Box 1008 Nome AK 99752	ELECTRICIAN
A1000103401	Burdwell, Incorporated	Registered	P.O. Box 873301 Wasilla AK 99587	ELECTRICIAN
A1000080251	Busch Electric, LLC	Registered	1425 Avion Street ANCHORAGE AK 99516	ELECTRICIAN
A1000135727	Carne Maintenance	Registered	P.O. Box 66 Wrangell AK 99359	ELECTRICIAN
A1000146732	Carstone Electric LLC	Registered	1295 Adams Street North Pole AK 99705	ELECTRICIAN
A1000103009	CHANNEL ELECTRIC, INC.	Registered	2236 Wingate Birch Drive Chugiak AK 99567	ELECTRICIAN
A1000080008	CITY & BOROUGH OF SITKA, ENVIRONMENTAL DEPT.	Registered	1351 COPPER RIDGE LANE KETCHIKAN AK 99901	ELECTRICIAN
A1000168011	CNS, Inc.	Registered	100 LINCOLN STREET SITKA AK 99585	ELECTRICIAN
A1000102662	DAS Electric, LLC	Registered	1285 Onnilit Drive Fairbanks AK 99709	ELECTRICIAN
A1000172910	Denine Building and Supply	Registered	6507 Shawnee Drive Eagle River AK 99577	ELECTRICIAN
A1000147696	Erica Electric, LLC	Registered	6672 Walker Street North Star AK 99669	ELECTRICIAN
A1000103587	Evista Electric	Registered	P.O. Box 1341 Cordova AK 99724	ELECTRICIAN
A1000138004	Florida Electric Services, LLC	Registered	P.O. Box 2020 Valdez AK 99574	ELECTRICIAN
A1000103388	Fuchs Electric, Incorporated	Registered	9400 Unimart Drive, Suite A Anchorage AK 99507	ELECTRICIAN
A1000138000	G2 Construction, Inc.	Registered	P.O. Box 106300 Fairbanks AK 99701	ELECTRICIAN
A1000144703	Glacier Electric	Registered	P.O. Box 113002 Anchorage AK 99511	ELECTRICIAN
A1000157696	GRS Controls	Registered	P.O. Box 54469 North Pole AK 99705	ELECTRICIAN
2017-AK-748	Hanson Construction, Incorporated	Registered	38050 Neenawa Avenue Seward AK 99672	ELECTRICIAN
A1000091967	Hicks Greens Creek Mining Company	Registered	P.O. Box 32199 Juneau AK 99801	ELECTRICIAN
2019-AK-73036	HomeTown Connection, Inc.	Registered	P.O. Box 439 Skagway AK 99840	ELECTRICIAN
A1000170010	ICE SERVICES, INCORPORATED	Registered	P.O. Box 2229 Seldovia AK 99669	ELECTRICIAN
A10001091697	IG&S Seafoods, Incorporated	Registered	2606 C-STREET, SUITE 28 ANCHORAGE AK 99503	ELECTRICIAN
A1000060009	INLET ELECTRICAL CONTRACTORS, LLC	Registered	411 N. Nordic Drive Petersburg AK 99833	ELECTRICIAN
A1000138001	Integrated Communication Designs, Inc.	Registered	P.O. BOX 202109 ANCHORAGE AK 99520	ELECTRICIAN
A1000126899	Integrity Electric, Inc.	Registered	P.O. Box 111551 Anchorage AK 99511	ELECTRICIAN

ANCHORAGE SCHOOL DISTRICT'S
LIST OF
ALASKAN FEDERALLY REGISTERED APPRENTICESHIP PROGRAMS

Program Number	Program Name	Program Status	Addresses	Occupation Title
A100070015	ALASKA JOINT ELECTRICAL APPRENTICESHIP & TRAINING TRUST	Registered	5800 1517 ANCHORAGE AK 99518	LINE MAINTANER (Alternate Title - Line Worker)
A100070016	ALASKA OPERATING ENGINEERS/EMPLOYERS TRAINING TRUST	Registered	P.O. BOX 0989 PALMER AK 99645	LINE MAINTANER (Alternate Title - Line Worker)
A1000108980	Alaska Power & Telephone	Registered	P.O. Box 3105 Juneau AK 99803	LINE MAINTANER (Alternate Title - Line Worker)
A10001040002	Alaska Village Electric Cooperative, Inc.	Registered	4831 Eagle Street Anchorage AK 99508	LINE MAINTANER (Alternate Title - Line Worker)
A10001089008	CITY & BOROUGH OF SITKA - ELECTRICAL DEPARTMENT	Registered	105 JARVIS STREET SITKA AK 99835	LINE MAINTANER (Alternate Title - Line Worker)
A10001355005	CITY OF UTAHASKA	Registered	P.O. Box 610 Utahsaka AK 99635	LINE MAINTANER (Alternate Title - Line Worker)
A10001060005	CITY OF WRANGELL-WRANGELL MUNICIPAL LIGHT & POWER SERVICES, INCORPORATED	Registered	2606 CSTRREET, SUITE 20 ANCHORAGE AK 99503	LINE MAINTANER (Alternate Title - Line Worker)
A10001089078	North Slope Borough Power & Light	Registered	P.O. Box 350 Barrow AK 99723	LINE MAINTANER (Alternate Title - Line Worker)
A1000147462	Nushagak Electric & Telephone Cooperative, Inc.	Registered	P.O. Box 350 Dillingham AK 99576	LINE MAINTANER (Alternate Title - Line Worker)
A1000700004	ALASKA OPERATING ENGINEERS/EMPLOYERS TRAINING TRUST	Registered	P.O. BOX 0989 PALMER AK 99645	LUBRICATION SERVICE MATERIAL DISPOSAL TECHNICIAN
A1000700015	ALASKA JOINT ELECTRICAL APPRENTICESHIP & TRAINING TRUST	Registered	5800 1517 ANCHORAGE AK 99518	MAINTENANCE MECHANIC, TELEPHONE
A1000000006	ALASKA WORKS PARTNERSHIP, INC	Registered	1413 HYDER ST ANCHORAGE AK 99502	MAINTENANCE REPAIRER, BUILDING
A1000125889	Goose Creek Correctional Center	Registered	P.O. Box 877790 Wasilla AK 99687	MAINTENANCE REPAIRER, BUILDING
A1000125889	Hiland Mountain Correctional Center	Registered	9101 Heiberger Road Eagle River AK 99577	MAINTENANCE REPAIRER, BUILDING
A10001900006	SPRING CREEK CORRECTIONAL CENTER	Registered	P.O. BOX 2109 SEWARD AK 99664	MAINTENANCE REPAIRER, BUILDING
A10001900010	Wilwood Correctional Center	Registered	BLOG 10, CHUGACH AVENUE KENAI AK 99611	MAINTENANCE REPAIRER, BUILDING
A10001910012	TECK ALASKA, INC.	Registered	3105 LAKESHORE DR., BUILDING A, STE 301 ANCHORAGE AK 99515	MECHANIC, INDUSTRIAL TRUCK
A1000500001	Alaska Carpenters Training Trust	Registered	8751 King Street Anchorage AK 99515	MILLWRIGHT
A10001910012	TECK ALASKA, INC.	Registered	3105 LAKESHORE DR., BUILDING A, STE 301 ANCHORAGE AK 99515	OPERATING ENGINEER
A1000900003	ABC of Alaska, Inc.	Registered	301 Arctic Slope Avenue, Suite 100 ANCHORAGE AK 99518	OPERATING ENGINEER
A1000700004	ALASKA OPERATING ENGINEERS/EMPLOYERS TRAINING TRUST	Registered	P.O. BOX 0989 PALMER AK 99645	PAINTER (Construction)
A1000147691	Wolverine Supply, Inc.	Registered	5099 E. Blue Lagoon Drive Wasilla AK 99654	PAINTER (Construction)
A1000900003	ABC of Alaska, Inc.	Registered	301 Arctic Slope Avenue, Suite 100 ANCHORAGE AK 99518	PIPE FITTER (Construction)
A1000900003	ABC of Alaska, Inc.	Registered	5821 Arctic Boulevard, Unit B ANCHORAGE AK 99518	PIPE FITTER (Construction)
A1000900003	ABC of Alaska, Inc.	Registered	301 Arctic Slope Avenue, Suite 100 ANCHORAGE AK 99518	PIPE FITTER (Construction)
A1000490001	International Union of Painters and Allied Trades Local 1859 IATC	Registered	617 WEST POTTER DRIVE ANCHORAGE AK 99518	PIPE FITTER (Construction)
A1000490002	ANCHORAGE ALASKA AREA PIPE TRADES LOCAL #367 IATC	Registered	1978 BURGESS AVENUE FAIRBANKS AK 99709	PIPE FITTER (Construction)
A10001510002	Fairbanks Area Plumbers & Pipefitters IATC	Registered	8751 ANNA STREET JUNEAU AK 99801	PLASTERER
A1000600001	JUNEAU PLUMBERS IATC	Registered	825 East 8th Avenue, Suite 10 Anchorage AK 99501	PLUMBER
A1000700017	ANCHORAGE ALASKA AREA PIPE TRADES LOCAL #367 IATC	Registered	P.O. Box 220033 Anchorage AK 99522	PLUMBER
A10001082770	907 Heating and Plumbing	Registered	2780 N. Heatherway Circle Wasilla AK 99654	PLUMBER
A1000125246	Ace Heating, Inc.	Registered	11805 Gregory Road Anchorage AK 99516	PLUMBER
A10001089007	Al Fish Plumbing, LLC	Registered	2780 N. Heatherway Circle Wasilla AK 99654	PLUMBER
A1000125886	Alaska Clearwater Mechanical, LLC	Registered	4500 Diplomacy Drive, Suite 454 Anchorage AK 99508	PLUMBER
A1000113542	Alaska Native Tribal Health Consortium, Division of Environmental Health & Engineering	Registered	P.O. Box 709 Willow AK 99688	PLUMBER
A10001050011	ALASKA PLUMBING & HEATING	Registered	P.O. Box 210240 Auke Bay AK 99821	PLUMBER
A10001089003	All American Plumbing & Heating	Registered	9509 Antler Way Juneau AK 99801	PLUMBER
A1000135008	All-Star Plumbing & Heating, LLC	Registered	11330 Bearpaw Street Anchorage AK 99516	PLUMBER
A1000157999	ALWAYS ON CALL MOUNTAIN MECHANICAL CORPORATION	Registered	8427 MENTRA STREET ANCHORAGE AK 99518	PLUMBER
A1000700007	ALWAYS ON CALL MOUNTAIN MECHANICAL CORPORATION	Registered	6593 Brayton Drive Anchorage AK 99507	PLUMBER
A1000490002	ANCHORAGE ALASKA AREA PIPE TRADES LOCAL #367 IATC	Registered	617 WEST POTTER DRIVE ANCHORAGE AK 99518	PLUMBER
A1000700016	ANCHORAGE PLUMBING & HEATING, INC.	Registered	7400 King Street ANCHORAGE AK 99518	PLUMBER
A1000500015	APEX PLUMBING & HEATING SERVICES, LLC	Registered	13087 E. Jessica Ann Street Slaton AK 99674	PLUMBER
A1000608112	Arctic Chain Plumbing & Heating, Inc.	Registered	1200 7th Avenue, Unit 1220 Anchorage AK 99518	PLUMBER
2019-AK-68594	Arctic Plumbing & Heating, LLC	Registered	2125 Richardson Highway, Suite #2, North Pole AK 99705	PLUMBER
2019-AK-672500	Bredley Mechanical Company	Registered	2125 Richardson Highway North Pole AK 99705	PLUMBER
A1000146922	Blades Mechanical	Registered	148 Hillcrest Avenue, #2 Subotina AK 99669	PLUMBER
A1000146921	Bolerman Plumbing & Heating, Inc.	Registered	6900 Lonestone Drive Palmer AK 99645	PLUMBER
A1000146013	BOWMAN MECHANICAL CONTRACTORS, INC	Registered	11701 1st Drive ANCHORAGE AK 99515	PLUMBER
A1000500242	Central Mechanical Incorporated	Registered	3317 Sika Street Anchorage AK 99502	PLUMBER
A1000135717	CH Heating and Heating, Inc.	Registered	1741 Bergery Road Anchorage AK 99518	PLUMBER
A1000135717	CH Heating and Heating, Incorporated	Registered	64525 PITMAN AVENUE AK 99508	PLUMBER
A1000147460	Chico Plumbing	Registered	4230 Chisholm Drive Fairbanks AK 99701	PLUMBER
A1000147460	Chico Plumbing, Incorporated	Registered	955 RILEY COURT FAIRBANKS AK 99701	PLUMBER
A10001820004	DISCOUNT MECHANICAL, INC.	Registered	P.O. Box 233664 Anchorage AK 99523	PLUMBER
A10001089005	Empire Plumbing & Heating, LLC	Registered	1308 Lakeshore Drive Homer AK 99608	PLUMBER
A10001040009	ENCORE MECHANICAL, INC.	Registered	P.O. BOX 1788 PALMER AK 99645	PLUMBER
A1000135716	Extreme Heating & Air, Incorporated	Registered	16905 Farm Avenue Eagle River AK 99577	PLUMBER
A10001455002	Fairbanks Area Plumbers & Pipefitters IATC	Registered	1978 BURGESS AVENUE FAIRBANKS AK 99709	PLUMBER
A10001455006	Fedor's Plumbing & Heating, LLC	Registered	5502 Cordova Street Anchorage AK 99518	PLUMBER
A1000125882	Funk Services	Registered	P.O. Box 672188 Cheyebak AK 99567	PLUMBER
A1000125249	Glicker Point Services	Registered	P.O. Box 61337 Fairbanks AK 99706	PLUMBER
A1000135912	H and M Plumbing & Heating, Inc.	Registered	P.O. Box 222225 Anchorage AK 99522	PLUMBER
A1000040007	HARDROCK PLUMBING AND HEATING, LLC	Registered	4740 E. FATTIC DRIVE WASILLA AK 99654	PLUMBER
A10001050004	HEATCO, LLC	Registered	17441 N. EAGLE RIVER LOOP ROAD EAGLE RIVER AK 99577	PLUMBER
2019-AK-72458	Homer Plumbing and Heating	Registered	581 Mountain View Drive Homer AK 99603	PLUMBER

ANCHORAGE SCHOOL DISTRICT'S
LIST OF
ALASKAN FEDERALLY REGISTERED APPRENTICESHIP PROGRAMS

Program Number	Program Name	Program Status	Address	Occupation Title
A000158005	Hunter Mechanical International Corporation	Registered	1377 East 4th Avenue, Suite 1, Anchorage, AK 99501	PLUMBER
A000170010	ICE SERVICES, INCORPORATED	Registered	2406 G STREET, SUITE 2B ANCHORAGE AK 99508	PLUMBER
A000168010	Ivy Strait Plumbing and Heating	Registered	8282a Gamel Street Juneau AK 99801	PLUMBER
A0001109402	Intelligent Design, LLC	Registered	11741 Timberlane Drive Anchorage AK 99515	PLUMBER
2018-AK-72080	IOLA Enterprises dba Runstrom Plumbing & Heating	Registered	HC 89 Box 8182, Tallrota AK 99676	PLUMBER
A0001081636	ISH Plumbing & Heating, Incorporated	Registered	P.O. Box 3385 Palmer AK 99645	PLUMBER
2018-AK-65772	John White's Plumbing & Heating	Registered	5327 Kenai Spur Highway Kenai AK 99611	PLUMBER
A000092650	John's Heating Service, Inc.	Registered	1311 Mill Bay Road Kodiak AK 99615	PLUMBER
A000060005	JOURNEYMAN PLUMBING & HEATING, INC.	Registered	51315 SEA QUEST DRIVE KENAI AK 99611	PLUMBER
A000660001	JUNEAU PLUMBERS IATC	Registered	1751 ANKA STREET JUNEAU AK 99801	PLUMBER
2017-AK-69607	Kaslof Plumbing & Heating	Registered	26547 S. Cobble Loop Kaslof AK 99610	PLUMBER
A0001157698	Kiwi Mechanical	Registered	Box 2132, Cordova AK 99574	PLUMBER
A0001050012	KNIX PLUMBING & HEATING	Registered	4915 W. 94TH AVENUE ANCHORAGE AK 99502	PLUMBER
A0000600017	LARRY'S PLUMBING & HEATING	Registered	P.O. BOX 4148 KODIAK AK 99615	PLUMBER
A0001147687	Larry's Quality Heating & Plumbing, Inc.	Registered	2531 Barrett Avenue Juneau AK 99801	PLUMBER
A000090234	Lewis Mechanical, Inc.	Registered	13240 View Heights Way Anchorage AK 99516	PLUMBER
A0000900011	M&J PLUMBING & HEATING, INC.	Registered	34360 Business Park Frontage Road SOLDOTNA AK 99669	PLUMBER
A000070010	MAT-SU MECHANICAL, INC.	Registered	1265 EAST LOLLY CIRCLE WASILLA AK 99654	PLUMBER
2017-AK-66889	Monkey Wrench Mechanical	Registered	P.O. Box 73441 Fairbanks AK 99707	PLUMBER
A000113541	Moore Heating & Air Conditioning	Registered	1801 East Dowling Road Anchorage AK 99507	PLUMBER
A0001144890	Mr. Roeder Plumbing of Fairbanks	Registered	875 Old Richardson Highway FAIRBANKS AK 99701	PLUMBER
A0001091696	North Country Stoves, Incorporated	Registered	2207 E. Tudor Road, #40 Anchorage AK 99507	PLUMBER
A000146528	Pacific Film Mechanical, LLC	Registered	P.O. Box 669 Haines AK 99827	PLUMBER
A0001070094	PARAGON PLUMBING & HEATING, INCORPORATED	Registered	3400 MACARTHUR STREET FAIRBANKS AK 99701	PLUMBER
A000000005	PARHUBST MECHANICAL	Registered	P.O. BOX 1806 Palmer AK 99645	PLUMBER
A0001050006	PEASANTS PLUMBING & HEATING	Registered	8301 SCHOOL STREET ANCHORAGE AK 99518	PLUMBER
A0001167795	Pollard Construction	Suspended	P.O. Box 32811 Juneau AK 99803	PLUMBER
A000092200	Porinwide Plumbing and Heating, Inc.	Registered	1500 Alaska Way Fairbanks AK 99709	PLUMBER
A0001106394	Premier Mechanical, LLC	Registered	2011 Millbay Road, #2 Kodiak AK 99615	PLUMBER
A0001167790	Red Hot Mechanical, Incorporated	Registered	11723 OH Green Highway, Suite 107 Eagle River AK 99577	PLUMBER
A000146735	River City Plumbing & Heating	Registered	865 6th Avenue Fairbanks AK 99701	PLUMBER
A0001177707	Rock Solid Plumbing & Heating	Registered	P.O. Box 67444 Wasilla AK 99687	PLUMBER
2017-AK-652	S.E. Plumbing, Incorporated	Registered	86 Garland Court Ketchikan AK 99901	PLUMBER
A000168008	Scott's Plumbing	Registered	P.O. Box 3132 Kodiak AK 99615	PLUMBER
A000098257	Scott's Heating & Plumbing Services, Inc.	Registered	22750 MC MANUS DRIVE CHUGIAK AK 99567	PLUMBER
A0001040017	STATEWIDE MECHANICAL, LLC	Registered	P.O. Box 561 Kasatoof AK 99610	PLUMBER
A0000983122	Sundance Construction Company, Inc.	Registered	P.O. Box 62409 Fairbanks AK 99708	PLUMBER
A000092651	Superior Mechanical, Inc.	Registered	P.O. Box 8639 Bethel AK 99559	PLUMBER
2018-AK-71943	Tauman Mechanical Plumbing & Heating, LLC	Registered	915 Stearns Street Ketchikan AK 99901	RESIDENTIAL CARPENTER
A0001070021	TAUMAN MECHANICAL CONTRACTING, INCORPORATED	Registered	P.O. Box 339 Wadai Cove AK 99401	RESIDENTIAL CARPENTER
A0001125707	Waterworks Plumbing & Heating	Registered	P.O. Box 128 Emmoak AK 99661	RESIDENTIAL CARPENTER
2019-AK-73100	Wolf Pack Mechanical, LLC	Registered	P.O. Box 521118 Big Lake AK 99662	RESIDENTIAL WIREMAN
A000030009	YUKON-KUSKOKWIM DELTA APPRENTICESHIP PROGRAM	Registered	P.O. BOX 969 BETHEL AK 99559	RESIDENTIAL WIREMAN
A000092654	Ketchikan Indian Community	Registered	915 Stearns Street Ketchikan AK 99901	RESIDENTIAL WIREMAN
A000115357	Nichols Construction, LLC	Registered	P.O. Box 339 Wadai Cove AK 99401	RESIDENTIAL WIREMAN
A000135994	Nuon River Flowing, LLC	Registered	P.O. Box 228 Emmoak AK 99661	RESIDENTIAL WIREMAN
A000030004	A & T ELECTRIC	Registered	1545 CROSSON AVENUE FAIRBANKS AK 99701	RESIDENTIAL WIREMAN
A000700018	ALASKA JOINT ELECTRICAL APPRENTICESHIP & TRAINING TRUST	Registered	9609 JF ANCHORAGE AK 99518	RESIDENTIAL WIREMAN
2017-AK-6172	Big W Electric, LLC	Registered	P.O. Box 24044 Fairbanks AK 99708	RESIDENTIAL WIREMAN
A0001138151	Engine Remedy	Registered	P.O. Box 1837 Ingram AK 99676	RESIDENTIAL WIREMAN
A000135893	Engendable Services	Registered	P.O. Box 952760 Wasilla AK 99687	RESIDENTIAL WIREMAN
A0001108511	Energy Remedy	Registered	2155 Kenai Bluffs Court Wasilla AK 99654	RESIDENTIAL WIREMAN
A000146733	Genex Electric Company, LLC	Registered	4133 Kenai Bluffs Court Wasilla AK 99654	RESIDENTIAL WIREMAN
A0000400014	INTERIOR REGIONAL HOUSING AUTHORITY	Registered	829 27TH AVENUE FAIRBANKS AK 99701	RESIDENTIAL WIREMAN
A000147692	Marty Wiles Electrical	Registered	1634 Sterling Highway Homer AK 99603	RESIDENTIAL WIREMAN
2017-AK-69670	New Hope Apprenticeship Training	Registered	2421 West Trailone Drive Wasilla AK 99654	RESIDENTIAL WIREMAN
A0001060007	Pacific North construction	Registered	P.O. Box 97295 Wasilla AK 99687	RESIDENTIAL WIREMAN
A0000900013	PITCHER SON ELECTRIC, INC.	Registered	P.O. BOX 87871 WASILLA AK AK 99687	RESIDENTIAL WIREMAN
A0001040001	RISING SON ELECTRIC SERVICES, LLC	Registered	18078 Elmura Lake Road Chugiak AK 99567	RESIDENTIAL WIREMAN
A0001108400	Solid Ground Electric	Registered	13811 Savage Drive Eagle River AK 99577	RESIDENTIAL WIREMAN
A0000550001	Alaska Concrete Training Trust	Registered	8751 10th Street Anchorage AK 99515	SCAFFOLD BLECTOR
A000090003	ABC of Alaska, Inc.	Registered	301 Arctic Slope Avenue, Suite 100 ANCHORAGE AK 99518	SHEET METAL WORKER
A000050001	ALASKA SCSE SHEET METAL WORKERS IATC	Registered	1807 E. 75TH AVENUE, #4 ANCHORAGE AK 99518	SHEET METAL WORKER
A0001870004	DENALI MECHANICAL, INC.	Registered	995 RILEY COURT FAIRBANKS AK 99701	SHEET METAL WORKER
A0001540001	FAIRBANKS AREA SHEET METAL WORKERS IATC	Registered	1260 ALUMINA DRIVE FAIRBANKS AK 99709	SHEET METAL WORKER
A0001086587	Valley Mechanical Contractors, Inc.	Registered	6573 E. Tex-A1 Drive Wasilla AK 99654	SHEET METAL WORKER

ANCHORAGE SCHOOL DISTRICT'S
 LIST OF

ALASKAN FEDERALLY REGISTERED APPRENTICESHIP PROGRAMS

Program Number	Program Name	Program Status	Address	Occupation Title
A1000950003	ABC of Alaska, Inc.	Registered	301 Arctic Slope Avenue, Suite 100 ANCHORAGE AK 99518	SPRINKLER FITTER (Existing Title: Pipe Fitter)
A10009490002	ANCHORAGE ALASKA AREA PIPE TRADES LOCAL #867 JATC	Registered	617 WEST POTTER DRIVE ANCHORAGE AK 99518	SPRINKLER FITTER (Existing Title: Pipe Fitter)
A10001510002	Fairbanks Area Plumbers & Pipefitters JATC	Registered	1578 BURGESS AVENUE FAIRBANKS AK 99709	SPRINKLER FITTER (Existing Title: Pipe Fitter)
A10000780016	ALASKA RIONWORKERS JATC	Registered	8441 SCHOOL STREET ANCHORAGE AK 99518	STRUCTURAL STEEL WORKER (Alternative Title: Ironworker or Structural Ironworker)
A10000940001	ALASKA TEAMSTER EMPLOYER SERVICE TRAINING TRUST	Registered	520 East 34th Avenue, Suite 201 ANCHORAGE AK 99503	SURVEYOR ASSISTANT INSTRUMENT
A10000940001	ALASKA JOINT ELECTRICAL APPRENTICESHIP & TRAINING TRUST	Registered	5800 E 17 STREET ANCHORAGE AK 99518	TREE TRIMMER (Line Clearance)
A10000040007	ALASKA TEAMSTER EMPLOYER SERVICE TRAINING TRUST	Registered	520 East 34th Avenue, Suite 201 ANCHORAGE AK 99503	TRUCK DRIVER, HEAVY
2017-NH-688.0	River Valley WorkForce Institute, Inc.	Registered	3125 Mount Support Road Lebanon NH 03766	WELDER, COMBINATION
A10001910002	TECK ALASKA, INC.	Registered	3105 AKESHORE DR., BUILDING A, STE 301 ANCHORAGE AK 99518	WELDER, COMBINATION

Multiple-employer apprenticeship sponsors.

**ANCHORAGE SCHOOL DISTRICT
APPRENTICE UTILIZATION FORM**

Project Name: _____

Solicitation Number: _____

Contractor: _____

Prime Contractors

1. Please list crafts/trades that will be used to complete this project and have Alaskan Federally Registered Apprenticeship programs.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

2. Please list the apprentices and corresponding apprenticeship programs that will be used by the prime contractor to complete this project. If more space is needed, please attach supplemental sheets.

APPRENTICE'S NAME	APPRENTICESHIP PROGRAM
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

3. Please list the subcontractors that will be used on the project.

_____	_____
_____	_____
_____	_____
_____	_____

4. Please list the apprentices and corresponding apprenticeship programs that will be used by the subcontractors to complete this project. If more space is needed, please attach supplemental sheets.

APPRENTICE'S NAME	APPRENTICESHIP PROGRAM
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

PENALTY TABLE

\$100,001 TO \$500,000

1ST NON-COMPLIANCE (30-DAY)	\$ 500.00	
2ND CONSECUTIVE NON-COMPLIANCE (30-DAY)	\$ 750.00	
3RD 30-DAY CONSECUTIVE NON-COMPLIANCE	\$ 1,000.00	
4TH CONSECUTIVE NON-COMPLIANCE (30-DAY)	\$ 1,000.00	AND FINDING OF NON-RESPONSIBILITY IN FUTURE BIDDING
FURTHER CONSECUTIVE NON-COMPLIANCE EXCEEDING 4TH NON-COMPLIANCE (30-DAY)	\$ 1,000.00	AND FINDING OF NON-RESPONSIBILITY IN FUTURE BIDDING

\$500,001 TO \$1,000,000

1ST NON-COMPLIANCE (30-DAY)	\$ 750.00	
2ND CONSECUTIVE NON-COMPLIANCE (30-DAY)	\$ 1,500.00	
3RD CONSECUTIVE NON-COMPLIANCE (30-DAY)	\$ 2,500.00	
4TH CONSECUTIVE NON-COMPLIANCE (30-DAY)	\$ 5,000.00	AND FINDING OF NON-RESPONSIBILITY IN FUTURE BIDDING
FURTHER CONSECUTIVE NON-COMPLIANCE EXCEEDING 4TH NON-COMPLIANCE (30-DAY)	\$ 5,000.00	AND FINDING OF NON-RESPONSIBILITY IN FUTURE BIDDING

\$1,000,001 TO \$3,000,000

1ST NON-COMPLIANCE (30-DAY)	\$ 1,000.00	
2ND CONSECUTIVE NON-COMPLIANCE (30-DAY)	\$ 2,500.00	
3RD CONSECUTIVE NON-COMPLIANCE (30-DAY)	\$ 5,000.00	
4TH CONSECUTIVE NON-COMPLIANCE (30-DAY)	\$ 7,500.00	AND FINDING OF NON-RESPONSIBILITY IN FUTURE BIDDING
FURTHER CONSECUTIVE NON-COMPLIANCE EXCEEDING 4TH NON-COMPLIANCE (30-DAY)	\$ 7,500.00	AND FINDING OF NON-RESPONSIBILITY IN FUTURE BIDDING

\$3,000,001 TO \$5,000,000

1ST NON-COMPLIANCE (30-DAY)	\$ 1,500.00	
2ND CONSECUTIVE NON-COMPLIANCE (30-DAY)	\$ 3,000.00	
3RD CONSECUTIVE NON-COMPLIANCE (30-DAY)	\$ 7,500.00	
4TH CONSECUTIVE NON-COMPLIANCE (30-DAY)	\$ 10,000.00	AND FINDING OF NON-RESPONSIBILITY IN FUTURE BIDDING
FURTHER CONSECUTIVE NON-COMPLIANCE EXCEEDING 4TH NON-COMPLIANCE (30-DAY)	\$ 10,000.00	AND FINDING OF NON-RESPONSIBILITY IN FUTURE BIDDING

OVER \$5,000,000

1ST NON-COMPLIANCE (90-DAY)	\$ 2,500.00	
2ND CONSECUTIVE NON-COMPLIANCE (90-DAY)	\$ 5,000.00	
3RD CONSECUTIVE NON-COMPLIANCE (90-DAY)	\$ 8,000.00	
4TH CONSECUTIVE NON-COMPLIANCE (90-DAY)	\$ 10,000.00	AND FINDING OF NON-RESPONSIBILITY IN FUTURE BIDDING
FURTHER CONSECUTIVE NON-COMPLIANCE EXCEEDING 4TH NON-COMPLIANCE (90-DAY)	\$ 10,000.00	AND FINDING OF NON-RESPONSIBILITY IN FUTURE BIDDING

END OF SECTION

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

REFERENCE:

The General Conditions shall be GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, ANCHORAGE SCHOOL DISTRICT, ANCHORAGE, ALASKA, bound herein.

SUPPLEMENTS:

Supplements may modify, change, delete, or add to these General Conditions. Where any article of the General Conditions is modified or any paragraph deleted, or any subparagraph or clause thereof is modified, or deleted by supplements, the unaltered provisions of such article, paragraph, subparagraph or clause shall remain in effect. The General Conditions and the Supplementary General Conditions are applicable to all of the Work under this Contract and shall apply to the Contractor and all Subcontractors, Sub-subcontractors, and Material Suppliers and Vendors.

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ARTICLE 1

CONTRACT DOCUMENTS

1.1 DEFINITIONS

1.1.1 The following terms as used in this Contract are defined as follows:

"Architect / Engineer or A/E": The design consultant of the Owner.

"Construction Manager": Supervises the construction phase of construction projects for the Anchorage School District Facilities Department.

"Contract": The Agreement between Owner and Contractor and the referenced Contract Documents stated therein.

"Contractor": The person, firm, or corporation contractually responsible to the Owner to provide the services called for by this Contract. Such entity may also be referred to as Managing General Contractor, General Contractor, or Prime Contractor.

"Days": Calendar days unless otherwise noted.

"Direct Cost": A direct cost is any cost that can be identified specifically with a particular final cost objective, i.e., with this contract, or an item of extra work, or change order under the contract.

"Senior Director of Capital Planning & Construction": Manages the Operations of the Anchorage School District Capital Planning & Construction Department.

"Furnish": Supply and deliver to the project including the cost to supply and deliver.

"Indirect Cost": An indirect cost, collectively called overhead, is any cost not directly identified with a single, final cost objective, but identified with two or more final cost objectives or an intermediate cost objective.

"Install": Build into the Work, ready to use in a complete, finished, and operable system, including the cost to install.

"Owner": The Anchorage School District, its Anchorage School Board of Education, the Superintendent of the Anchorage School District, and its employees.

"Project Manager": The person designated by the Senior Director of Capital Planning & Construction as the Owner's representative for this Contract, responsible for the day-to-day coordination between the Owner and the Contractor.

"Provide": Furnish and install for a complete, finished, and operable system.

"Reasonable Cost": A cost is reasonable if, in its nature or amount, it does not exceed that which would be incurred in a competitive market.

"Shop Drawings, Setting Drawings, Manufacturer's Printed Information and Submittal (collectively known as "Submittals")": The Contractor's information consisting of drawings, catalogs, illustrations, calculations, and other data delivered to the Owner for the purpose of assuring the Owner, prior to execution of that part of the Work, that the prescriptive element, component, subsystem, or service to be provided generally conforms with the

Contract. The Contractor is responsible to the Owner for the accuracy and completeness of the Submittals.

"Subcontractor": A person, firm, or entity who has a direct contract with the Contractor to perform any of the work.

"Work" or "Project": The finished product required by the Contract Documents together with the means and methods as determined, by the Contractor, to achieve the finished product.

1.1.2 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Owner-Contractor Agreement, the Drawings, the Project Manual, and all Addenda issued prior to and all Modifications issued after execution of the Contract. A Modification is (1) a directive for change in the work pursuant to Section 12.1.2 or (2) a change order pursuant to Section 12.2.6.

1.1.3 THE CONTRACT

The Contract is the sum of all the Contract Documents. This Contract represents the entire and integrated agreement between the Owner and the Contractor and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification as defined in Subparagraph 1.1.2.

1.1.4 THE WORK

The Work comprises the completed construction required by the Contract Documents and includes all labor necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction.

1.1.5 THE PROJECT

The Project is the total construction, of which the Work performed under the Contract documents may be the whole or a part.

1.1.6 SCHOOL BOARD

Board of Education of the Anchorage School District, Anchorage, Alaska.

1.1.7 BIDDER

Any individual, firm, partnership, corporation or combination thereof, formally submitting a bid for the work contemplated, or any portion thereof, acting directly or through an authorized representative.

1.1.8 MUNICIPALITY

Municipality of Anchorage, Alaska.

1.1.9 PROPOSAL

1.1.9.1 BID PROPOSAL

The written proposal of the Bidder on the form furnished by the Owner for the Work contemplated, and which is required to be signed by the Bidder.

1.1.9.2 REQUEST FOR PROPOSAL (RFP)

The offer of the Contractor submitted on the prescribed form from the Project Manager to perform the work and furnish labor, material and all other costs at the prices quoted by the Contractor for proposed changes in the work.

1.1. 10 SPECIFICATIONS

The products, directions, requirements, explanations, terms and provisions pertaining to the various features of the Work to be done and the manner and method of performance. The specifications include such directions, requirements and explanations as appear on the drawings and as may otherwise be defined.

1.1. 11 PROJECT SITE

The geographic location of the Project as indicated on the Drawings.

1.1. 12 PROJECT MANUAL

The Project Manual includes the Bidding and Contract Requirements, Project Schedule Milestone Dates, General and Supplementary Conditions, Wage Rates, the Specifications and project drawings incorporated by reference.

1.1. 13 REQUEST FOR INFORMATION

Request for Information. Written interpretations necessary for the proper execution or progress of the Work, in the form of drawings or otherwise, will be issued with reasonable promptness by the Project Manager. The Contractor may make written request to the Project Manager for such interpretations. Such interpretations will be consistent with and reasonably inferable from the Contract Documents.

1.2 EXECUTION, CORRELATION AND INTENT

1.2.1 The Contract shall be signed in doubles by the Owner and Contractor, each of which shall be deemed an original, but all or which shall constitute one and the same instrument.

1.2.2 By executing the Contract, the Contractor represents that he has visited the site, familiarized himself with the local conditions under which the Work is to be performed, and correlated his observations with the requirements of the Contract Documents.

1.2.3 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work. Except as otherwise specifically provided, the Contractor shall furnish all labor, tools, implements, machinery, supplies, materials, and incidentals, and shall do all things necessary to perform and to complete the Work. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. Work not covered in the Contract Documents will not be required unless it is consistent therewith and is reasonable inferable therefrom as being necessary to produce the intended results. Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings unless otherwise specifically defined herein.

1.2.4 The organization of the Specifications into division, sections and articles, and the arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by a trade.

1.2.5 If any portion of the Contract Documents shall be in conflict with any other portion, the

various documents comprising the Contract Documents shall govern in the following order of precedence:

- 1.2.5.1 The Owner-Contractor Agreement;
- 1.2.5.2 Modifications;
- 1.2.5.3 Addenda;
- 1.2.5.4 Section 00800 - Supplementary General Conditions;
- 1.2.5.5 Section 00700 - General Conditions of the Contract for Construction;
- 1.2.5.6 Specifications - embodying all other sections in the Project Manual;
- 1.2.5.7 Drawings: as between schedules and information given on Drawings, the schedules shall govern; as between written dimensions given on Drawings and scaled measurements, the written dimensions shall govern; as between large-scale Drawings and small-scale Drawings, the larger scale shall govern;
- 1.2.5.8 Performance Bond, Labor and Material Payment Bond;
- 1.2.5.9 Bid/Proposal Form;
- 1.2.5.10 Instructions to Bidders/Proposers;
- 1.2.5.11 Invitation to Bid/Request for Proposal;

All such conflicts shall be reported, in writing, to the Project Manager. Schedules, lists, indexes, tables, inventories, written instruction, written descriptions, summaries, statements, classifications, specifications, written selections, or written designations, although appearing on the Drawings, are deemed to be and are "Specifications" as defined by this Subparagraph 1.2.5. The principles as set forth herein shall not alter the provisions of Subparagraph 1.2.3.

In the event there is a conflict between or among any provisions within one of the component parts of the Contract Documents, the higher standard or more stringent requirement shall govern.

- 1.2.6 The Contractor agrees that nothing contained in the Contract Documents or any contract between the Owner and the Architect shall create any contractual relationship between the Architect and the Contractor, any Subcontractors, Sub-subcontractors, Material Suppliers or Vendors. The Contractor acknowledges and agrees that this Contract is not intended to create, nor shall any provision be interpreted as creating, any contractual relationship between the Owner or Contractor or any third parties.
- 1.2.7 Any material or operation specified by reference to published specifications of a manufacturer, a society, an association, a code, or other published standard, shall comply with requirements of the listed document and project specifications; or as between referenced documents, the more stringent code or performance requirements shall govern. The Contractor, if requested, shall furnish an affidavit from the manufacturer certifying that the materials or products delivered to the Project meet the requirement specified.

1.3 OWNERSHIP AND USE OF DOCUMENTS

- 1.3.1 All Drawings, Specifications and copies thereof furnished by the Owner are and shall remain its property. They are to be used only with respect to this Project and are not to be used on any other project.
- 1.3.2 The Owner will provide conformed drawings and specifications incorporating Addenda items into the Contract Documents. A reasonable number of reproduced sets will be provided to the contractor without charge.

END OF ARTICLE 1

ARTICLE 2

ARCHITECT

2.1 DEFINITION

- 2.1.1 The Architect is the person or organization lawfully licensed to practice architecture, or an entity lawfully practicing architecture identified as such in the Owner-Contractor Agreement, and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Architect means the Architect and his engineers, whether under contract or within his own organization, or his authorized representative.
- 2.1.2 The term Architect is interchangeable with the term Project Architect, and is exclusive of the services of the Asbestos Abatement Architect.
- 2.1.3 The Asbestos Abatement Architect is not a part of the Architect's organization.

2.2 SERVICES OF THE ARCHITECT

- 2.2.1 The Architect will provide certain services as hereinafter described.
- 2.2.2 Should errors, omissions, or conflicts in the Drawings, Specifications, or other Contract Documents provided by the Architect be discovered, the Architect will prepare such amendments or supplementary documents and provide consultation as may be required.
- 2.2.3 The Architect and his consulting engineers (including but not limited to the structural, mechanical, and electrical disciplines) will visit the site at intervals appropriate to the stage of construction to familiarize themselves generally with the progress and quality of the Work and to determine in general if the Work is proceeding in accordance with the Contract Documents. Unless otherwise provided in the Owner-Architect Agreement, the Architect and his consulting engineers will not be required to make exhaustive or continuous on-site inspection or observations to check the quality or quantity of the Work, but they shall make as many on-site inspections and observations as may reasonably be required to fulfill their obligations to the Owner. On the basis of such on-site observation, the Architect and his consulting engineers shall endeavor to guard the Owner against defects and deficiencies in the Work of the Contractor.
- 2.2.4 The Architect will render written field reports to the Project Manager in the form required by the Project Manager relating to the periodic visits and inspections of the Project required by Subparagraph 2.2.3.
- 2.2.5 The Architect will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and he will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Architect will not be responsible for or have control or charge over the acts or omissions of the Contractor, Subcontractors, or any of their agents or employees, or any other persons performing any of the work.
- 2.2.6 The Architect shall at all times have access to the Work wherever it is in preparation or progress. The Contractor shall provide safe facilities for such access so the Architect may perform his functions under the Contract Documents.
- 2.2.7 The Project Manager will consult with the Architect regarding the Contractor's Applications for Payment and both shall sign the Applications for Payment as provided in Subparagraph

9.4.

- 2.2.8 As required, the Architect will render to the Project Manager interpretations necessary for the proper execution or progress of the Work, with reasonable promptness and in accordance with any time limit agreed upon.
- 2.2.9 All communications, correspondence, submittals, and documents exchanged between the Architect and the Contractor in connection with the Project shall be through or in the manner prescribed by the Project Manager.
- 2.2.10 All interpretations and decisions of the Architect will be consistent with the intent of and reasonably inferable from the Contract Documents.
- 2.2.11 The Architect's decision in matters relating to artistic effect will be final if consistent with the intent of the Contract Documents and approved by the Project Manager.
- 2.2.12 If the Architect observes any Work that does not conform to the Contract Documents, the Architect shall promptly report in writing this observation to the Project Manager. The Architect will prepare and submit to the Project Manager punchlists of the Contractor's Work which is not in conformance with the Contract Documents. The Project Manager will transmit such punchlists to the Contractor.
- 2.2.13 The Architect will review and take appropriate action upon Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for conformance with the design concept of the Work and for general compliance with the Contract Documents. Such action shall be taken in no more than twenty-one (21) days of receipt unless otherwise authorized by the Project Manager.
- 2.2.14 The Project Manager will establish with the Architect procedures to be followed for review and processing of all Shop Drawings, catalog submittals, project reports, test reports, maintenance manuals, and other necessary documentation, as well as requests for changes and applications for extensions of time.
- 2.2.15 The Architect will prepare technical documentation for Change Orders when directed by the Project Manager.
- 2.2.16 The Architect and the Project Manager will conduct inspections to determine the dates of Substantial Completion and Final Completion, and will issue a final Certificate of Substantial Completion.
- 2.2.17 Unless otherwise provided in the Contract Documents, or the Owner-Architect Agreement, the Architect will prepare a set of reproducible record prints of Drawings showing significant changes in the Work made during the construction process, based on neatly and clearly marked-up prints, Drawings, and other data furnished by the Contractor.
- 2.2.18 In case of the termination of the employment of the Architect, the Owner may appoint an architect against whom the Contractor makes no reasonable objection whose status under the Contract Documents shall be that of the former architect, or the Owner may have the Project Manager assume all of the services of the Architect thereafter.

2.3 ASBESTOS ABATEMENT ARCHITECT

- 2.3.1 Solely with regards to asbestos abatement, the Asbestos Abatement Architect shall be afforded the same rights and authority as hereinbefore allowed the Architect.

2.3.2 The Architect is not a part of the Asbestos Abatement Architect's organization.

2.4 SEPARATE ARCHITECT, ENGINEER OR ARCHITECT/ENGINEER

2.4.1 Unless otherwise noted in the Contract Documents, the Separate Architect, Engineer or Architect/Engineer, as defined by the Supplementary General Conditions, Document 00800, shall be afforded the same rights and authority as hereinbefore allowed the Architect.

2.4.2 The Contract Documents, when applicable, shall define the portion of the Work relating to the services of the Separate Architect, Engineer or Architect/Engineer.

END OF ARTICLE 2

ARTICLE 3

OWNER

3.1 DEFINITIONS

- 3.1.1 The Owner is the Anchorage School District acting through its legally constituted officials, officers, employees, or agents and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Owner means the Owner or its authorized representative or agent.
- 3.1.2 The Asbestos Abatement Consultant is under separate Agreement with the Owner. Communications protocol between the Contractor and the Asbestos Abatement Architect shall be as established by the Project Manager.

3.2 PROJECT MANAGER

- 3.2.1 The Project Manager will be the Owner's representative and agent to the Contractor with respect to the Project during construction and until the issuance of the final Certificate for Payment. The term Project Manager is referred to throughout the Contract Documents as if singular in number and masculine in gender. The Owner's communications with the Contractor and the Architect will be through the Project Manager, who will have full authority to act on behalf of the Owner with regard to all aspects of the Project except that the Owner must approve all Change Orders and payments to the Contractor. The Project Manager's actions with regard to this project will be as an agent and representative of the Owner.
- 3.2.2 The Project Manager is not authorized to revoke, alter, change, relax, or release any requirements of the Contract, nor to approve or accept any portion of the Work not executed in accordance with, nor to issue instructions contrary to, the Contract Documents.
- 3.2.3 Nothing contained within the Contract Documents shall create any contractual relationship between the Project Manager and the Contractor.

3.3 INFORMATION, SERVICES AND RIGHTS OF THE OWNER

- 3.3.1 The Owner, through the Project Manager, will provide administration of the Contract as hereinafter described.
- 3.3.2 The Owner and the Project Manager shall at all times have access to the Work whenever it is in preparation or progress. The Contractor shall provide safe facilities for such access.
- 3.3.3 The Owner and the Project Manager shall not be responsible for or have control or charge of the construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work and will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Project Manager will not be responsible for the acts or omissions of the Contractor, any Subcontractors, or any of their agents or employees, or any other persons performing any of the Work.
- 3.3.4 The Project Manager shall have authority on behalf of the Owner to condemn or reject Work when, in the Project Manager's opinion the Work does not conform to the Contract Documents. Whenever, in the Project Manager's reasonable opinion, it is considered necessary or advisable to insure the proper implementation of the intent of the Contract Documents, the Project Manager shall have the authority to require special inspection or

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testing of any Work in accordance with the provisions of the Contracts Documents, whether or not such Work be then fabricated, installed, or completed.

- 3.3.5 The Project Manager will have authority to require additional inspection or testing of the Work in accordance with Subparagraph 7.7.3, whether or not such Work be then fabricated, installed, or completed. However, neither the Project Manager's authority to act under Subparagraphs 3.3.4 and 3.3.5, nor any decision made by the Project Manager in good faith either to exercise or not to exercise such authority shall give rise to any duty or responsibility of the Project Manager to the Contractor, any Subcontractor, any of their agents or employees, or any other persons performing any of the work.
- 3.3.6 The Project Manager shall have the authority and discretion to call, schedule, and conduct job meetings to be attended by the Contractor, and representatives of his Subcontractors, and Material Suppliers, and Vendors and the Architect, to discuss such matters as procedures, progress, changes, problems, claims and scheduling.
- 3.3.7 The Project Manager will establish procedures to be followed for processing all Shop Drawings, catalogs, and other project reports, and other documentation, test reports, and maintenance manuals.
- 3.3.8 The Project Manager will review all requests for changes and shall implement the processing of Change Orders, including applications for extension of the Contract time.
- 3.3.9 Project scheduling shall occur as set forth in Division 1, Section 01311 of the General Requirements, entitled "Schedules and Reports". The Owner and the Project Manager will not be responsible for the failure of the Contractor to plan, schedule, and execute the Work in accordance with the Contractor's accepted schedule or the failure of the Contractor to meet the Project Schedule Milestone Dates as set forth under Section 00200 hereof or the failure of the Contractor to schedule and coordinate the Work of his own trades and Subcontractors, and Material Suppliers and Vendors, or the failure of the Contractor to coordinate and cooperate with other separate contractors.
- 3.3.10 The Project Manager, in consultation with the Architect, will review and process all Applications for Payment by the Contractor, including the final Application for Payment.
- 3.3.11 The Owner and the Project Manager will not be responsible for the acts or omissions of the Contractor, or any Subcontractor, or Material Supplier and Vendor, or any contractor's, subcontractor's or Material Supplier's and Vendor's agents or employees, or any other persons performing any of the Work.
- 3.3.12 The Owner shall, if requested by the Contractor, furnish all existing and available surveys describing the physical characteristics, legal limitations and utility locations for the site of the Project.
- 3.3.13 Except as otherwise provided in the Contract Documents, the Owner shall pay for necessary easements required for permanent structures or for permanent changes in existing facilities. The Contractor shall be responsible for obtaining all necessary permits and coordinating the securing of easements, inspections and approvals for permanent structures and all associated work.
- 3.3.14 Information or services under the Owner's control shall be furnished by the Owner with reasonable promptness to avoid delay in the orderly progress of the Work.
- 3.3.15 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, all copies of Drawings and Specifications, and such supplemental

documents as are reasonably necessary for the execution of the Work.

- 3.3.16 The foregoing rights are in addition to other rights of the Owner enumerated herein and those provided by law.

3.4 OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS

- 3.4.1 The Owner reserves the right to perform other work at the project site(s) with his own forces, and to award separate contracts in connection with portions of other work on the site.
- 3.4.2 The Contractor shall afford the Owner and separate Contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their Work, and shall coordinate his Work with theirs as required by the Contract Documents.
- 3.4.3 A pre-construction conference will be held with the Contractor, Project Manager, and other contractors performing work at the project site, for the purpose of coordinating work in areas where more than one contractor may be working. The time of the meeting will be established by the Owner's Representative prior to the Contractor commencing his work.
- 3.4.4 The Contractor shall attend additional coordination meetings, as requested by the Owner's Representative.

3.5 OWNER'S RIGHT TO STOP OR TO SUSPEND THE WORK

- 3.5.1 If the Contractor fails to correct defective Work as required by Paragraph 13.2 or fails to carry out the Work or supply labor and materials in accordance with the Contract Documents, the Owner, through the Project Manager, by a written order may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the Project Manager to stop the Work on behalf of the Owner shall not give rise to any duty on the part of the Project Manager to exercise this right for the benefit of the Contractor or any other person or entity.
- 3.5.2 The Project Manager may order the Contractor in writing to suspend, delay, or interrupt all or any part of the Work for such period of time as he may determine to be appropriate for the convenience of the Owner.
- 3.5.3 Upon receipt of any such suspension order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize incurring costs allocated to the Work covered by the order during the period of Work suspension.
- 3.5.4 If the performance of all or any part of the Work is suspended, or delayed, or interrupted by the Owner or the Project Manager pursuant to Subparagraph 3.5.2, the Contractor may make application for an adjustment in contract time and contract sum pursuant to Paragraph 12.2, and Division 1, Section 01311, Paragraph 2.03, respectively. No such adjustment shall be made if the performance of the Work is suspended by the Owner pursuant to Subparagraph 3.5.1.

3.6 OWNER'S RIGHT TO CARRY OUT THE WORK

- 3.6.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within seven (7) days after receipt of written notice from the Project Manager to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, after seven (7) days following receipt by the Contractor of an additional written notice and without prejudice to any other remedy he may have,

make good such deficiencies and may further elect to complete all Work thereafter through such means as the Owner may select, including the use of a new Contractor. In such a case an appropriate Change Order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including additional Owner administrative and legal costs, and compensation for the Architect's and the Project Manager's additional services made necessary by such default, neglect or failure. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

3.7 AUDIT

- 3.7.1 The Owner shall have access to the Contractor's books, accounts, records, invoices and other records and documents pertaining to the Project at all reasonable times for the purpose of inspecting and auditing such. The Contractor shall provide to the Owner his daily manpower and equipment reports for all Subcontractors and any and all information requested or required by the Owner to validate or verify an Application for Payment, claim for cost or a requisition. The Contractor shall have no right to additional compensation or time in the event a requisition is delayed due to the inability of the Owner to validate or verify an Application for Payment due to the failure or refusal of the Contractor to allow such inspection or audit or to provide such requested information.
- 3.7.2 The Contractor shall maintain all data and records pertinent to the Work performed under this Contract in accordance with generally accepted accounting principles, and shall preserve and make available all data and records until the expiration of three (3) years from the date of final payment under this Contract, or for such longer period, if any, as is required by applicable statute, pending litigation, or by other articles of this Contract. The Owner and its authorized representatives shall have access to all such data and records for such time period to inspect, audit and make copies thereof during normal business hours.
- 3.7.3 The Contractor covenants and agrees that it shall require that any Subcontractor and any Sub-Subcontractor utilized in the performance of this Contract shall permit the authorized representatives of the Owner to similarly inspect and audit all data and records of said Subcontractors and Sub-Subcontractors relating to the performance of said Subcontractors and Sub-Subcontractors under this Contract for the same time period specified above.

END OF ARTICLE 3

ARTICLE 4

CONTRACTOR

4.1 DEFINITION

4.1.1 The Contractor is the person or organization identified as such in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his authorized representative, who shall have the authority to bind the Contractor in all matters pertinent to this Contract.

4.2 REVIEW OF CONTRACT DOCUMENTS

4.2.1 Before placing his proposal to the Owner, and continuously after execution of the Contract, the Contractor shall carefully study and compare the Contract Documents and shall at once report to the Owner, through the Project Manager, any error, inconsistency or omission he may discover, including any requirement which may be contrary to any law, ordinance, rule, regulation or order of any public authority bearing on the performance of the Work. By submitting his proposal or bid for the Contract and the Work under it, the Contractor agrees that the Contract Documents appear accurate, consistent, and complete insofar as can reasonably be determined. If the Contractor has reported in writing an error, inconsistency or omission, has promptly stopped the affected work until otherwise instructed, and has otherwise followed the instructions of the Owner, the Contractor shall not be liable to the Owner for any damage resulting from any such errors, inconsistencies or omissions in the Contract Documents. The Contractor shall perform no portion of the Work at any time without Contract Documents and, where required, approved Shop Drawings, Product Data or Samples for such portion of the Work.

4.3 SUPERVISION AND CONSTRUCTION PROCEDURES

4.3.1 The Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for and have control over all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract.

4.3.2 The Contractor shall be responsible to the Owner for the acts and omissions of his employees, Subcontractors, and Material Suppliers and Vendors, and their agents and employees, and other persons performing any of the work.

4.3.3 The Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the Architect or the Project Manager in their administration of the Contract, or by inspections, tests or approvals (or the lack thereof) required or performed under Paragraph 7.7 by persons other than the Contractor.

4.3.4 Independent of this Contract, the Owner has undertaken a long term asbestos abatement program by which the Owner intends to properly document the existence of asbestos-contained materials and the lawful removal of ACM by qualified asbestos abatement contractors or subcontractors in accordance with the Asbestos Hazard Emergency Response Act (AHERA) and the Asbestos School Hazard Abatement Reauthorization Act (ASHARA). As part of this asbestos abatement program, the Owner has employed a private consultant to locate asbestos-containing materials present in the Owner's facilities. A copy of the AHERA report as it relates to the facility which is involved in this Contract can be obtained from the Owner by contacting the Project Manager.

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- 4.3.4.1 Before starting the Work or any Section of the Work, the Contractor shall inspect or, if using a Subcontractor for a Section of the Work, shall cause his Subcontractor to inspect all preparatory work, including that performed prior to the commencement of the Work under this Contract, for the presence of suspected asbestos-containing materials.
- 4.3.4.2 If the Contractor or his Subcontractor encounters any asbestos-containing material or suspected asbestos-containing material -- whether such material is identified in the AHERA report or the private consultant's report or not -- the Contractor shall bring it to the immediate attention of the Project Manager by timely written notice. Such notification shall be considered timely if received by the Project Manager within two (2) days after the discovery of the asbestos-containing material or suspected asbestos-containing material by the Contractor or by a Subcontractor if the Contractor uses a Subcontractor to perform that Section of the Work. If the Contractor does not give timely notice of the presence of asbestos-containing material or suspected asbestos-containing material, the Contractor will not receive additional compensation for delay caused by the necessity of the Owner to stop work and abate asbestos-containing material during the course of the Work. Failure of a Subcontractor to report the presence of asbestos-containing material or suspected asbestos-containing material to the Contractor shall not relieve the Contractor of his responsibilities hereunder.
- 4.3.4.3 If the Contractor, or his employees, agents or subcontractors intentionally or negligently disturbs or removes, or causes to be disturbed or removed, all or a portion of asbestos-containing material, the Contractor shall indemnify, hold harmless and defend the School District and the Project Manager from and against any claims, damages, losses and expenses, and alleged claims, damages, losses and expenses, including but not limited to attorney's fees, arising out of or resulting from any cleanup/decontamination work, medical treatment, or legal action arising or resulting from said intentional or negligent disturbance or removal of asbestos-containing material.
- 4.3.5 The Contractor shall make all necessary arrangements and so conduct the Work that all parts of the same will be carried out simultaneously and harmoniously and that the work of installing the various sections or items of same shall not interfere with or retard the progress of other Work.
- 4.3.6 If it becomes necessary at any time during the progress of the Work to move materials and/or equipment which have been temporarily located or stored, the Contractor shall move them or cause them to be moved, at his expense. Care shall be taken that no part of the Work shall be overloaded at any time.
- 4.3.7 The Contractor shall furnish all required information to ensure continuity between various sections of the Work and to avoid delay and obviate defects on any part of the whole Work, all as approved by the Owner.
- 4.3.8 Any damage caused by the handling or installation of materials or equipment, or the carrying out of any portion of the Work must also be made good by the Contractor to the satisfaction of the Project Manager.
- 4.3.9 The Contractor shall compare all the various drawings, and shall install Work in a manner to provide for all clearances and finishes indicated thereon. Work under each trade shall be arranged to clear piping, equipment, etc., of all other trades.
- 4.3.10 The Contractor shall inform himself fully regarding any peculiarities and limitations of the

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space available for the installation of the material. He shall see that all equipment, such as valves, or other appliances necessary to be reached from time to time for operations and maintenance are made readily accessible.

- 4.3.11 The construction of the Work may develop conditions that render impracticable the location of equipment as shown or noted. In such cases, before installing his Work, the Contractor shall call the condition to the attention of the Project Manager for resolution.
- 4.3.12 It shall be the Contractor's sole responsibility to so coordinate the Work that chases or other recesses in walls shall be provided where required, and that reasonable clearance between the work of various trades shall be maintained. The layout for openings and chases through walls, floors, and partitions, etc., shall be arranged in advance of the actual construction and the work carried out without unnecessary and superfluous cutting, etc., after the Work has been completed.
- 4.3.13 Dimensions shall be verified by the measurements of the buildings and the property, and the Contractor shall be responsible for all of his work fitting in place in a satisfactory and workmanlike manner.
- 4.3.14 The Contractor has carefully examined, in detail, all of the Drawings and Specifications and the time established for completion of the Work, and he accepts them as adequate to meet the requirements specified.
- 4.3.15 The Contractor shall be responsible for coordinating the work performed by any artist in connection with the project's ornamentation with the construction of this project, so that there shall be no unnecessary delay or interference in connection with said construction.
- 4.3.16 The Contractor shall coordinate and generally supervise the Work of this Contract and shall coordinate his Work with Work performed under Separate Contracts by mutual arrangement and agreement with the Contractors for those Contracts and the Project Manager. Unresolved disputes will be finally resolved by the Project Manager, subject to approval of the Owner, and the dispute resolution provisions of Subparagraph 12.5.

4.4 LABOR AND MATERIALS

- 4.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the execution and completion of the Work in accordance with the Contract Documents, and any applicable building permit, conditional and final certificate(s) of occupancy, code or statute, whether specifically required by the Contract Documents or whether their provision may reasonably be inferred as necessary to produce the intended results, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.
- 4.4.2 The Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to him. The Project Manager may, by notice in writing, require the Contractor to promptly remove from the site of the Work any employee or worker the Project Manager deems incompetent, careless or otherwise objectionable including violation of District Policies relating to alcohol, illegal drugs, or firearms on District property.
- 4.4.3 The Contractor shall be responsible for ensuring that the Work is completed in a skillful and workmanlike manner.

4.5 WARRANTY

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- 4.5.1 The Contractor warrants to the Owner and the Architect that all materials and equipment furnished under this Contract will be new unless otherwise specified, and that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All Work not conforming to these requirements, including substitutions not properly approved and authorized, is defective. If required by the Project Manager or the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. This warranty is not limited by the provisions of Paragraph 13.2.
- 4.5.2 The warranties set forth in this Paragraph 4.5 and elsewhere in the Contract Documents shall survive final acceptance under Paragraph 9.9.
- 4.6 TAXES
- 4.6.1 The Contractor shall pay all sales, consumer, use and other similar taxes for the Work or portions thereof provided by the Contractor which are legally enacted at the time bids are received, whether or not yet effective.
- 4.7 PERMITS, FEES AND NOTICES
- 4.7.1 Except as specifically provided in Subparagraph 3.3.13 the Contractor shall secure and pay for (1) all permits and governmental fees, licenses and inspections necessary for the proper execution of the Work which are legally required at the time the bids are received, and (2) all permits and governmental fees, licenses and inspections from any agency or department of the Municipality of Anchorage that would be necessary for the proper execution of the Work or legally required at the time bids are received just as if the Work were performed and the Project located within the Municipality of Anchorage. The Municipality of Anchorage shall be considered a "public authority bearing on the performance of the Work" and a "public authority having jurisdiction" for purposes of this Contract.
- 4.7.1.1 The Anchorage School District has paid for the Municipality of Anchorage's Building Plan Review and Building Fee Permit. Contractor shall obtain permit upon notice from Project Manager.
- 4.7.2 The Contractor shall give all notices and comply with all such laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the performance of the Work.
- 4.7.3 If the Contractor performs any Work knowing it to be contrary to any such laws, ordinances, rules, regulations or orders of any public authority bearing on the performance of the Work, and does so without reasonable notice to the Project Manager, the Contractor shall assume full responsibility therefore and shall bear all costs attributable thereto.
- 4.7.4 Notification, coordination and completion of the installation of all required utilities, whether temporary or permanent, is the sole responsibility of the Contractor. The Owner shall not be responsible for any damage or delay caused by any party's inability to perform installations in the time frame desired by the Contractor.
- 4.8 ALLOWANCES
- 4.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by these allowances shall be supplied for such amounts and by such persons as the Owner may direct, but the Contractor will not be required to employ persons against whom he makes a reasonable objection.

4.8.2 Unless otherwise provided in the Contract Documents:

- 4.8.2.1 These allowances shall cover the cost to the Contractor, less any applicable trade discount, of the materials and equipment required by the allowance delivered at the site, and all applicable taxes;
- 4.8.2.2 The Contractor's costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the original allowance shall be included in the Contract Sum and not in the allowances;
- 4.8.2.3 Whenever the cost is more than or less than the allowance, the Contract Sum shall be adjusted accordingly by Change Order, the amount of which will recognize changes, if any, in handling costs on the site, labor, installation costs, overhead, profit and other expenses.

4.9 SUPERINTENDENT

- 4.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance full-time at the Project Site during the progress of the Work. The superintendent shall represent the Contractor, and all communications given to the superintendent shall be as binding as if given to the Contractor. If requested by the Project Manager, the Contractor shall provide a management chart and a list of personnel in a number stipulated by the Project Manager which shall comprise the superintending staff. In such event, all references to the superintendent elsewhere in the Contract Documents shall mean the superintending staff.
- 4.9.2 The superintendent shall be in attendance at the Project Site not less than eight (8) hours per day, five (5) days per week, unless the job is closed down due to a general strike or conditions beyond the control of the Contractor or until termination of the Contract in accordance with the Contract Documents. The superintendent shall not be employed on any other project during the course of the Work.
- 4.9.3 In the event any of the following conditions shall exist, the Contractor shall require that his superintendent be at the Project Site not less than ten (10) hours per day, six (6) days per week:
 - 4.9.3.1 Should Substantial Completion not be accomplished on schedule.
 - 4.9.3.2 Should Final Completion not be accomplished on schedule.
 - 4.9.3.3 Should the Contractor's progress schedule indicate the Contractor to be fourteen (14) or more days behind schedule at any time during construction up until thirty (30) days prior to scheduled Substantial Completion.
 - 4.9.3.4 Should the Contractor's progress schedule indicate the Contractor to be seven (7) or more days behind schedule at any time during the last thirty (30) days prior to scheduled Substantial Completion.

4.10 CONSTRUCTION SCHEDULE

- 4.10.1 The Contractor shall prepare and submit to the Project Manager for the Owner's review and acceptance a construction schedule pursuant to and in accordance with Division 1, Section 01311 of the General Requirements entitled "Project Schedule."

4.11 DOCUMENTS AND SAMPLES AT THE SITE

4.11.1 The Contractor shall maintain at the site for the Owner one record copy of all Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to record all changes made during construction, and approved Shop Drawings, Product Data and Samples. These shall be available to the Project Manager and the Architect and shall be delivered to the Project Manager upon substantial completion of the Work.

4.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

4.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or any Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

4.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, diagrams, and other information furnished by the Contractor to illustrate a material, product or system for some portion of the Work.

4.12.3 Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

4.12.4 The Contractor shall review, approve and submit using the ASD Procore Construction Management Program, with reasonable promptness and in such sequence as to cause no delay in the Work or in the work of the Owner or any separate contractor, all Shop Drawings, Product Data and Samples required by the Contract Documents, or subsequently by the Project Manager. The Contractor's Shop Drawings, Product Data, and Samples submissions shall be coordinated and consistent with the Contractor's Project Scheduling obligations under Division 1, Section 01311 of the Contract Documents. Shop Drawings and Samples shall be properly identified as specified, or as the Project Manager may require. At the time of submission, the Contractor shall inform the Architect in writing of any deviation in the Shop Drawings or Samples from the requirements of the Contract Documents.

4.12.5 By approving and submitting Shop Drawings, Product Data and Samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. The Contractor shall adhere to any supplementary processing and scheduling instruction pertaining to Shop Drawings which may be issued by the Project Manager.

4.12.6 The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Architect's approval and Project Manager's review of Shop Drawings, Product Data or Samples under Subparagraph 2.2.14 unless the Contractor has specifically informed the Architect and Project Manager in writing of such deviation at the time of submission and the Architect and Project Manager have given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omission in the Shop Drawings, Product Data or Samples by the Architect's approval of or Project Manager's review thereof.

4.12.7 The Contractor shall promptly make corrections required by the Architect and shall resubmit the required number of corrected copies of Shop Drawings or new Product Data or Samples. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the

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Architect on previous submittals. Resubmittals necessitated by required corrections due to Contractor's errors or omissions, or less than complete submittals as required by the specifications, shall not be cause for extension of Contract Time.

- 4.12.8 The Contractor shall keep on the job at all times copies of approved Shop Drawings, Product Data or Samples which bear the review stamp of the Architect/Engineer.
- 4.12.9 The review of Shop Drawings, Product Data or Samples by the Architect and Project Manager shall not relieve the Contractor from his responsibility to coordinate the work of the Subcontractors.
- 4.12.10 The review of Shop Drawings, Product Data or Samples by the Architect and the Project Manager shall not relieve the Contractor of his responsibilities to construct the work in accordance with the Contract Documents.
- 4.12.11 The review of Shop Drawings, Product Data or Samples by the Architect shall not be construed as an approval of the quantities of materials or confirmation of dimensions.
- 4.12.12 In preparing a schedule for delivery of materials the Contractor shall allow reasonable time for the approval, including resubmissions due to Contractor's errors and omissions, of Shop Drawings, Product Data or Samples.
- 4.12.13 When Shop Drawings, Cuts, or Brochures are forwarded to the Architect by the Contractor for approval, a copy of the Contractor's letter of transmittal with project name, Contractor's name, number of drawings, title and other pertinent data covering each transaction is to be mailed to the Project Manager. The Architect and his consulting Engineers shall follow the same procedure when it is necessary for them to return or transfer Shop Drawings, Cuts or Brochures either between themselves or to the Contractor for changes, corrections or resubmittal, so that the Project Manager can record and follow procedure for each transaction to finality.
- 4.12.13.1 Pursuant to and consistent with the Contractor's Project Schedule development obligations under Division 1, Section 01311 of the Contract Documents, the Contractor shall submit Shop Drawings, Product Data and Sample submission schedule information to the Architect and Project Manager. The Contractor shall submit, and the Architect and Project Manager will review, the Contractor's submittals in accordance with the Contractor's accepted Preliminary and Detailed Project Schedules, as required under Division 1, Section 01311 of the Contract Documents. The Contractor shall submit no Shop Drawings, Product Data or Samples which do not comply with the Contract Documents.
- 4.12.13.2 No portion of the Work requiring a Shop Drawing, Product Data or Sample submission shall be commenced until such submission has been reviewed, and approved, by the Architect in accordance with Subparagraph 2.2.13. All such portions of the Work shall be in accordance with approved submittals.
- 4.12.13.3 No claim for delay shall be allowed the Contractor on account of failure of the Architect to furnish drawings or approval of Shop Drawings and Samples until at least twenty-one (21) days after submission to the Architect.
- 4.12.14 Shop Drawings, Product Data, and Samples shall be dated and shall bear the name of the Project; a description or the names of equipment, materials and items; and complete identification of locations at which materials or equipment are to be installed.

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- 4.12.15 In submitting for approval the use of any material or device as the equal of some other material or device specified by name, the Contractor shall submit a sample of the material specified and also a sample of the material proposed to be submitted as the equal thereof, together with any supporting data necessary to reasonably allow the Architect and the Project Manager to review the material.
- 4.12.16 In case of devices, samples of which cannot readily be submitted, catalogs and other data, shall be submitted.
- 4.12.17 Any material or device proposed to be substituted shall not be deemed acceptable except by written communication from the Architect and Project Manager.
- 4.12.18 All Work for which samples are required to be submitted and approved shall be executed and performed in conformity with the said approved samples.

4.13 USE OF SITE

- 4.13.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the building or site with any materials or equipment.
- 4.13.2 The Contractor shall coordinate all of his operations with and secure approval from the Project Manager before using any portion of the site.
- 4.13.3 All Work or materials of every description subject to injury during the course of the Work shall be fully protected from damage from any source. In any event, should any Work or materials under this Contract, become damaged in any way or manner the Contractor shall repair and perfect the same at his own expense, and when the entire Contract is completed, the building and premises shall be delivered to the Owner without defects. Any damage which may be caused by the installation of any portion of the Work covered by these specifications and conditions, or by the Contractor shall be satisfactorily made good and repaired by the Contractor without cost to the Owner.
- 4.13.4 The Contractor shall provide and maintain all lights, footways, guards, fences, gates, etc., for the proper protection of the public, and shall comply with all municipal rules, regulations, ordinances and laws, relating to the prosecution of his work.
- 4.13.5 The Contractor shall properly and carefully shore up or otherwise support all live water, sewer and gas pipes, electric wires, free-standing walls, conduit, etc., which may be encountered.
- 4.13.6 The Contractor shall furnish for his use, throughout the entire construction all scaffolding, ladders, decking or runways as needed to perform the Work under this Contract.
- 4.13.7 The Contractor shall construct elevators, cranes and other rigging, concrete lifts, etc., as required for his Work.
- 4.13.8 All such construction shall be carried out as required by the code or authority having jurisdiction. No cranes or other heavy equipment shall be located or moved in such manner as to damage or strain the framework or any part(s) of the proposed building and/or existing building.
- 4.13.9 As construction proceeds, the Project Manager may deem it necessary to have the Contractor move trailers, fences, stored materials, etc., to facilitate the construction. Upon written notice from the Project Manager, this will be done without additional cost to the

Owner.

- 4.13.10 When school is in session the Contractor will be restricted to the areas which do not interfere with school operations. These areas shall be safety and security fenced to not impact school operations. Additional areas may be utilized upon concurrence of the Project Manager. The Contractor shall minimize his impact on the educational program while his work is in progress. Workers must stay out of school while school is in session. All work in the existing school can only take place during the hours approved by the Project Manager
- 4.13.11 The Contractor must maintain interior building fire exits through the construction areas and maintain these exits during all school operation hours, to the satisfaction of the Authorities having Jurisdiction. These exit routes may not be modified without concurrence of the Project Manager and the School Principal.
- 4.13.12 The Contractor must maintain fire equipment access routes open to site and buildings. According to UFC 10.502 fire equipment access and water supplies shall be installed and made serviceable prior to and during the time of construction. This is the Contractor's responsibility to coordinate.
- 4.13.13 The Contractor shall keep the boilers operational while the average outside temperature is below 60° F while the school program is in operation or at any time temperature is below 40° F, to protect facility utility systems.

4.14 CUTTING AND PATCHING OF WORK

- 4.14.1 The Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the Work or to make its several parts fit together properly.
- 4.14.2 The Contractor shall not damage or endanger any portion of the Work or the work of the Owner or any separate contractors by cutting, patching or otherwise altering any work, or by excavation. The Contractor shall not cut or otherwise alter the work of the Owner or any separate Contractor except with the written consent of the Owner and of such separate Contractor. The Contractor shall not unreasonably withhold, from the Owner, or any separate contractor his consent to cutting or otherwise altering the Work.
- 4.14.3 Existing structures and facilities including but not limited to building, utilities, topography, streets, curbs, walks, etc., that are damaged or removed due to required excavations or other construction work, shall be patched, repaired or replaced by the Contractor to the satisfaction of the Project Manager, the owner of such structures and facilities, and authorities having jurisdiction. In event the local jurisdictional authorities require that such repairing and patching be done with their own labor and materials, the Contractor shall abide by such regulations and pay for such work.
- 4.14.4 Whenever, for the convenience of work, an oversized opening has been provided, it shall be the responsibility of the Contractor requesting and requiring such opening to eventually fill unused portions of such openings with the appropriate material and with special attention to penetrations of firewalls. Such repair shall be in accordance with Paragraph 4.14.1.

4.15 CLEANING UP

- 4.15.1 The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the Work he shall remove all his waste materials and rubbish from and about the Project as well as all his

tools, construction equipment, machinery and surplus materials.

4.15.2 If the Contractor fails to clean up during or at the substantial or final completion of his Work, the Owner may do so as provided in Paragraph 6.3 and the costs thereof shall be charged to the Contractor.

4.16 COMMUNICATIONS

4.16.1 The Contractor shall forward all communications to the Architect or the Owner through the Project Manager, except as described under Paragraph 4.12.13.

4.17 ROYALTIES AND PATENTS

4.17.1 The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified, but if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Project Manager.

4.18 INDEMNIFICATION

4.18.1 To the fullest extent permitted by law, the Contractor shall, at his sole cost and expense, indemnify, hold harmless and defend the Owner, the Municipality of Anchorage and their Board or Assembly members, administrators, representatives, and employees, and the Project Architect and its agents, representatives, and employees from and against all claims, actions, judgments, costs, liabilities, penalties, damages, losses and expenses, including but not limited to attorneys' fees, which arise out of or result from the performance of the Work, and which are:

4.18.1.1 Attributable to bodily injury, sickness, disease or death, or to injury to, pollution of, or destruction of property (other than the Work itself) including the loss of use resulting therefrom; and

4.18.1.2 Caused by the default of the Contractor, or by any act, whether negligent or wrongful, or omission of the Contractor, any Subcontractor, Material Supplier or Vendor, anyone directly or indirectly employed by any of them or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

4.18.2 In any and all claims against the Owner or the Municipality of Anchorage or their Board or Assembly members, administrators, representatives or employees, and the Project Architect and its agents, representatives, and employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Paragraph 4.18 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor and Subcontractor under worker's compensation acts, disability benefit acts or other employee benefit acts.

4.19 PERSONS AUTHORIZED TO SIGN DOCUMENTS

4.19.1 The Contractor, within five (5) days after the Notice to Proceed shall file with the Project Manager a list of all persons who are authorized to sign documents such as contracts,

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modifications, schedules, certificates, and affidavits on behalf of the Contractor and to fully bind the Contractor to all the Conditions and provisions of such documents, except that in the case of a corporation he shall file with the Project Manager a certified copy of a resolution of the Board of Directors of the corporation in which are listed the names and titles of corporation personnel who are authorized to sign documents on behalf of the corporation and to fully bind the corporation to all the conditions and provisions of such documents. This person, or at least one of these persons, shall be available to meet in Anchorage, Alaska, with the Owner or his representative(s) to discuss, negotiate and/or resolve any Change Order or other Modification to the Contract or any other matter needing resolution by the parties as determined at the sole discretion of the Owner within forty-eight (48) hours after receipt of written notice, at no additional cost to the Owner.

4.20 CONDITIONS AFFECTING THE WORK

- 4.20.1 The Contractor shall be responsible for taking all steps necessary to ascertain the nature and location of the Work and the general and local conditions which can affect the Work or the cost thereof. Failure by the Contractor to fully acquaint himself with conditions which may affect the Work, including, but not limited to conditions relating to transportation, handling, storage of materials, availability of labor, water, roads, weather, topographic and subsurface conditions, multi-prime contract conditions, applicable provisions of law, and the character and availability of equipment and facilities needed prior to and during the execution of the Work, shall not relieve the Contractor of his responsibilities under the Contract Documents and shall not constitute a basis for an adjustment in the Contract Sum or the Contract Time under any circumstances. The Owner assumes no responsibility for any understanding or representation about conditions affecting the Work made by any of his officers, employees, representatives, or agents prior to the execution of the Contract, unless such understandings or representations are expressly stated in the Contract Documents.
- 4.20.2 Until final acceptance by the Owner, the Contractor shall be in complete control of and fully responsible for the Work.
- 4.20.3 The Contractor shall give to the proper authorities all required notices relating to the Work in his charge, and shall be responsible for all acts and events which are violations of the law or which would be violations of the law had the Work been performed or the Project located within the Municipality of Anchorage.
- 4.20.4 Wherever herein mention is made of any article, material or workmanship to be in accordance with the laws, ordinances, building code, Underwriter's Code, and A.S.T.M. Specifications or similar expressions, the requirement of these laws, ordinances, etc., shall be construed as the minimum requirements of these Specifications, and all articles, materials and workmanship required by these laws, ordinances, etc., shall be provided by the Contractor without any additional cost to the Owner.
- 4.20.5 Where the requirements of the laws, ordinances, etc., are mandatory, they shall govern.
- 4.20.6 Where the requirements of the Specifications call for higher grade or are not in conflict with the laws, ordinances, etc., the Specifications shall govern.
- 4.20.7 In case of any apparent conflict between the Specifications and such laws, ordinances, etc., the Contractor shall immediately call the attention of the Project Manager (in writing) to such conflict for decision, before proceeding with any work which may involve such conflict.

END OF ARTICLE 4

ARTICLE 5

SUBCONTRACTORS

5.1 DEFINITION

- 5.1.1 A Subcontractor is a person, organization or entity who has a direct contract with the Contractor to perform any of the Work. The term Subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representative. The term Subcontractor does not include any separate contractor or his subcontractors.
- 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform any of the Work. The term Sub-subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Sub-subcontractor or an authorized representative thereof.
- 5.1.3 Nothing contained in the Contract Documents is intended to, nor shall it create, any contractual relationship between the Owner, the Project Manager, the Architect, or any of their agents, employees, or representatives and any Subcontractor or Sub-subcontractor.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

- 5.2.1 The Contractor, in compliance with the requirements of the Contract Documents, shall furnish to the Project Manager in writing the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work. The Project Manager will within ten (10) days of receipt of such information reply to the Contractor in writing stating whether or not the Owner, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Project Manager to reply within a reasonable time shall constitute notice of no reasonable objection. The Contractor understands and agrees that no contractual agreement exists for any part of the Work under this Contract between the Owner and any of the Contractor's Subcontractors or Sub-subcontractors. Further, the Contractor understands and agrees that he alone is responsible to the Owner for all of the Work under this Contract and that any review of Subcontractors or Sub-subcontractors by the Owner or Project Manager will not in any way make the Owner responsible to any Subcontractor or Sub-subcontractor, nor responsible for the actions or failures of any Subcontractor or Sub-subcontractor.
- 5.2.1.1 Within ten (10) days after the Notice to Proceed, the Contractor shall furnish to the Project Manager, in writing, for acceptance by the Owner, a list of names of the Subcontractors, Sub-subcontractors, and Material Suppliers and Vendors, proposed for the principal portions of the Work.
- 5.2.1.2 Within thirty-five (35) days after Notice to Proceed, the Contractor shall submit to the Project Manager, copies of Purchase Orders or other satisfactory evidence of purchase for all major materials.
- 5.2.2 The Contractor shall not contract with any such proposed person or entity to whom the Project Manager has made reasonable objection under the provisions of this Subparagraph.
- 5.2.2.1 The Contractor shall not be required to contract with anyone to whom he has a reasonable objection. There shall be no entitlement to additional compensation based upon the Project Manager's reasonable objection made

under this Section.

- 5.2.3 If the Project Manager has reasonable objection to any such proposed person or entity, the Contractor shall submit a substitute to whom the Project Manager has no reasonable objection.
- 5.2.4 The Contractor shall make no substitution for any Subcontractor, person or entity previously selected if the Project Manager makes reasonable objection to such substitution.
- 5.2.5 During the course of the Project the Contractor must notify the Project Manager in writing regarding any changes in any Work by any Subcontractor, Sub-subcontractor, Material Supplier or Vendor.

5.3 SUBCONTRACTUAL RELATIONS

- 5.3.1 By an appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Documents, assumes toward the Owner. Said agreement shall preserve and protect the rights of the Owner under the Contract Documents with respect to the Work to be performed by the Subcontractor so that the subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the Contractor-Subcontractor agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by these Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with his Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the Subcontract, copies of the Contract Documents to which the Subcontractor will be bound by this Paragraph 5.3, and identify to the Subcontractor any terms and conditions of the proposed Subcontract which may be at variance with the Contract Documents. Each Subcontractor shall similarly make copies of such Documents available to his Sub-subcontractors, Material Suppliers or Vendors.
- 5.3.2 In addition to Sub-Contractual agreement in Paragraph 5.3.1, the Contractor shall allow the Subcontractor, Sub-subcontractor, Material Supplier or Vendor to notify the Project Manager due to failure of payment, unwarranted retainage or deductions of payment or unwarranted lateness of payment.
- 5.3.3 As a condition precedent to the acceptance of the Contractor's proposed Preliminary and Detailed Project Schedules by the Project Manager, each major Subcontractor shall in writing, with the submission of said schedules by the Contractor, confirm that they have reviewed the Contractor's proposed Project Schedules, and that each concurs with the activity breakdowns, durations, cost loading, and logic as relates to each major Subcontractor's scope of the Work and the incorporation of said Work into the Contractor's proposed Preliminary and Detailed Project Schedules, as prescribed under Division 1, Section 01311 of the General Requirements of the contract documents.

5.4 PREPARATORY WORK

- 5.4.1 Before starting work, the responsible Subcontractor shall carefully examine all preparatory Work that has been executed to receive his Work. He shall check carefully, by whatever means are required, to ensure that his work and adjacent related Work will finish to proper contours, planes, and levels. He shall promptly notify the Contractor and the Project

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Manager of any defects or imperfections in preparatory Work which will, in any way, affect satisfactory completion of his Work. Absence of such notification will be construed as an acceptance of preparatory work and later claims of defects therein will not be recognized.

5.4.2 Each Subcontractor is required to follow the provisions of 4.3.4 relating to asbestos abatement.

5.5 PAYMENTS TO SUBCONTRACTORS, SUB-SUBCONTRACTORS, AND MATERIAL SUPPLIERS AND VENDORS

5.5.1 If the Project Manager withholds a Certificate for Payment for any cause which is the fault of the Contractor and not the fault of a particular Subcontractor, Sub-subcontractor, and Material Supplier and Vendor, the Contractor shall pay that Subcontractor, Sub-subcontractor, Material Supplier and Vendor on demand, made at any time after the Certificate for Payment should otherwise have been issued, for his work to the extent completed, less any retained percentage.

5.5.2 The Contractor shall pay each Subcontractor, Sub-subcontractor, and Material Supplier and Vendor a just share of any insurance monies received by the Contractor, and he shall require each Subcontractor to make similar payments.

END OF ARTICLE 5

ARTICLE 6

WORK BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS

- 6.1.1 The Owner reserves the right to perform work related to the Project with his own forces, and to award separate contracts in connection with other portions of the Project or other work on the site under these or similar Conditions of the Contract.
- 6.1.2 When separate contracts are awarded for different portions of the Project or other work on the site, the term Contractor in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.
- 6.1.3 Upon transfer of such separate contracts to a General Contractor, if the Owner so desires to transfer such contracts, the Contractor shall be obligated to the conditions as outlined by Paragraph 6.3. of these Conditions.

6.2 MUTUAL RESPONSIBILITY

- 6.2.1 The Contractor shall afford the Owner and separate Contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their Work, and shall connect and coordinate his Work with theirs as required by the Contract Documents.
- 6.2.2 If any part of the Contractor's Work depends for proper execution or results upon the Work of the Owner or any separate contractor, the Contractor shall, prior to proceeding with the Work, promptly report to the Owner any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Failure of the Contractor to so inspect and report in writing to the Owner shall constitute an acceptance of the Owner's or separate contractors' work as fit and proper to receive his Work, except as to defects which may subsequently become apparent in such work by others.
 - 6.2.2.1 In addition to inspection as to defect, the Contractor, if so deemed necessary by the Contractor, shall measure or inventory work already in place or stored and shall at once report, in writing, to the Project Manager any conflicts between the executed Work and the Contract Documents the Contractor has signed his name thereto.
 - 6.2.2.2 Upon notification from the Owner that a part of the Work furnished under this Contract is not in accordance with the Contract Documents, the Contractor shall immediately initiate action to correct the Work.
 - 6.2.2.3 If the Contractor fails to install his Work in a timely manner, the Owner through the Project Manager may authorize other Contractor(s) to perform their Work out of proper sequence. All extra Work necessary to properly interface with the other Contractor(s)' Work will be accomplished by this Contractor at no additional cost to the Owner.
- 6.2.3 Any costs caused by defective or ill-timed work shall be borne by the Contractor.
- 6.2.4 Should the Contractor wrongfully cause damage to the Work or property of the Owner, or to other Work on the site, the Contractor shall promptly remedy such damage as provided in Subparagraph 10.2.5.

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- 6.2.5 Should the Contractor wrongfully cause damage to the work or property of any separate contractor, the Contractor shall upon due notice promptly attempt to settle with such other Contractor by agreement; or otherwise to resolve the dispute. If such separate Contractor sues or initiates a proceeding against the Owner, the Project Manager and/or the Architect on account of any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor who shall defend such proceedings at his own expense, and if any judgment or award against the Owner, the Project Manager, and/or the Architect arises therefrom the Contractor shall pay or satisfy it and shall reimburse the Owner, the Project Manager and/or the Architect for all attorneys' fees and court or other costs which the Owner, the Project Manager and/or the Architect have incurred.
- 6.2.6 In the event there is more than one contractor engaged on the Project, each such contractor shall be responsible to the other for damages to work, injury to any person or persons, or for any loss, cost, claims, or damages arising out of or in connection with the Work required by this Contract or any loss, cost, expense, or damage caused by the Contractor's neglect or failure to finish or satisfactorily complete his part of the Work within the time prescribed. In all events, the provisions of Paragraph 4.18 shall be applicable.
- 6.2.7 Whenever the Contractor receives items from another Contractor or from the Owner for storage, erection or installation, the Contractor receiving such items shall give receipt for items delivered, and thereafter will be held responsible for care, storage and any necessary replacing of item or items received.
- 6.2.8 The separate contractors shall establish and maintain communication throughout the course of their Work to assure maximum coordination of the Work performed by each. This includes the approvals of the Work of each as required by proper coordination.
- 6.3 OWNER'S RIGHT TO PERFORM DISPUTED WORK
- 6.3.1 If a dispute arises between the Contractor and separate contractors as to their responsibility for cleaning up as required by Paragraph 4.15 or for accomplishing coordination or doing required cutting, filling, excavating or patching as required by Paragraph 4.14, the Owner may carry out such Work and charge the cost thereof to the contractors responsible therefor as the Owner shall determine to be just.
- 6.4 EQUIPMENT OR WORK NOT IN CONTRACT (NIC)
- 6.4.1 When certain items of equipment and other work are indicated as "NIC" (Not In Contract), or to be furnished and installed under other contracts, any requirements for preparation of openings, provision of backing, etc., for receipt of such "NIC" work, information will be furnished upon written request of the Contractor who shall properly form and otherwise prepare his Work in a satisfactory manner to receive such "NIC" work.
- 6.5 CUTTING AND PATCHING UNDER SEPARATE CONTRACTS
- 6.5.1 Each Contractor shall be responsible for any cutting, fitting and patching that may be required to complete his Work except as otherwise provided in the Contract Documents. The Contractor shall not endanger any human life or portion of the Work performing any cutting, excavating or otherwise altering the Work or any part thereof.

END OF ARTICLE 6

ARTICLE 7

MISCELLANEOUS PROVISIONS

7.1 GOVERNING LAW

7.1.1 Unless otherwise provided in the Contract Documents, the Contract shall be governed by the law of the place where the Project is located.

7.2 SUCCESSORS AND ASSIGNS

7.2.1 The Owner and the Contractor each binds himself, his partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party in respect to all covenants, agreements and obligations contained in the Contract Documents. The Contractor shall not assign the Contract or sublet it as a whole without the written consent of the Owner, nor shall the Contractor assign any monies due or to become due to him hereunder, without the previous written consent of the Owner.

7.3 WRITTEN NOTICE

7.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or entity or to an officer of the corporation for whom it was intended, or if delivered at or sent by registered or certified mail to the last business address known to him who gives the notice.

7.4 CLAIMS FOR DAMAGES

7.4.1 Should the Contractor suffer injury or damage to person or property because of any act or omission of the Owner or of any of his employees, agents or others for whose acts he is legally liable, claim shall be made in writing to the Owner, through the Project Manager, within twenty (20) days after the first observance of such injury or damage; otherwise, the Contractor shall have waived any and all rights he may have against the Owner, the Project Manager, the Architect, or their employees, representatives or agents.

7.4.2 Decisions of the Project Manager shall be rendered as provided for under the Contract Documents, but no decision of the Project Manager shall deprive the Owner or the Contractor of any form of redress which may be available under the laws of the State. Any decision of the Project Manager shall be final and binding on the Contractor in the absence of written notice of protest from the Contractor received by the Owner by registered mail, within fifteen (15) days of the date of the decision of the Project Manager. The Owner shall have sixty (60) days from the date of receipt of a formal protest within which to investigate and make reply.

7.5 PERFORMANCE BOND AND PAYMENT BOND

7.5.1 Prior to the execution of the Contract, the Contractor shall furnish to the Owner, on forms acceptable to the Owner, surety bonds in the amounts and for the purposes provided in this Paragraph 7.5. Each bond must be signed by both the Contractor and the Surety. The current power of attorney for the person who signs for the surety company, indicating the monetary limit of such powers, must be attached to the bonds. The Contractor shall pay all premiums and cost thereof and incidental thereto. Such bonds shall be made payable to the Owner. The surety (or sureties) shall be corporate surety(ies) licensed to transact business in Alaska and acceptable to the Owner. Each bond shall be in an amount equal to the Contract Sum. The effective date of the bond shall be on the execution date of the

contract.

- 7.5.2 The "Performance Bond" shall be so conditioned as to assure the faithful performance by the Contractor of all Work under said Contract, within the time limits prescribed, including any maintenance provisions, in a manner that is satisfactory and acceptable to the Owner; that all materials and workmanship supplied by him will be free from original or developed defects; and that should original or developed defects or failures appear within a period of one year from the date of final acceptance of the Work by the Owner, the Contractor shall, at his own expense, make good such defects and failures and make all replacements and adjustments required, within a reasonable time after being notified by the Owner to do so. This bond shall be maintained by the Contractor in full force and effect during the performance of the Work of the Contractor and for a period of two (2) years after the date of final acceptance of the Work by the Owner.
- 7.5.3 The "Payment Bond" shall be so conditioned as to inure to the benefit of persons furnishing materials for or performing labor upon the Work. This bond shall be maintained by the Contractor in full force and effect until the Work is completed and finally accepted by the Owner, and until all claims for materials, labor and subcontracts are paid.
- 7.5.4 Should any surety or sureties upon said bonds become insufficient or be disqualified from doing business in Alaska, the Contractor shall renew said bond or bonds with good and sufficient sureties, acceptable to the Owner, within ten (10) work days after receiving notice that the surety or sureties are insufficient and/or disqualified. Should any surety or sureties be deemed unsatisfactory at any time by the Owner, notice will be given the Contractor to that effect, and he shall forthwith substitute a new surety or sureties satisfactory to the Owner. No further payment shall be deemed due or will be made under this Contract until the new sureties shall qualify and be accepted by the Owner.
- 7.5.5 In the event of any change order resulting in the performance of additional work in connection with the Work, the amounts of such bonds shall be increased by the cost of such additional work or materials or fixtures to be incorporated into the Project.

7.6 RIGHTS AND REMEDIES

- 7.6.1 The Contractor's duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.
- 7.6.2 Except as may be specifically agreed in writing, the failure of the Owner, the Project Manager, or the Architect to insist in any one or more instances upon the strict performance of any one or more of the provisions of this Contract, or to exercise any right herein contained or provided by law, shall not be construed as a waiver or relinquishment of the performance of such provision or right(s) or of the right to subsequently demand such strict performance or exercise such right(s), and the rights shall continue unchanged and remain in full force and effect.
- 7.6.3 The Contractor agrees that he can be adequately compensated by money damages for any breach of this Contract which may be committed by the Owner and hereby agrees that no default, act, or omission of the Owner, the Project Manager or the Architect, except for unauthorized failure to make payments as required by the Contract Documents, shall constitute a material breach of the Contract entitling the Contractor to cancel or rescind the provisions of this Contract or (unless the Owner shall so consent or direct in writing) to suspend or abandon performance of all or any part of the Work. The Contractor hereby waives any and all rights and remedies to which he might otherwise be or become entitled, save only his right to money damages.

7.7 TESTS

- 7.7.1 If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any portion of the Work to be inspected, tested, or approved, the Contractor shall give the Architect and Project Manager timely notice, but not less than seventy-two (72) hours, of its readiness so the Architect and the Project Manager may observe such inspection, testing or approval. The Contractor shall bear all costs of such inspections, tests or approvals except as provided in subparagraph 7.7.2. Notification, coordination and execution of all inspections and tests required by the Contract Documents or by the governing building department shall be the sole responsibility of the Contractor. The Owner shall not be responsible for any damage or delay caused by any Party's inability to make required inspections in the time frame desired by the Contractor.
- 7.7.2 Special Inspection and testing as required in accordance with IBC section 1704 shall be coordinated by the Contractor and the Owner shall bear all costs of Special Inspections or approvals. The Special Inspector, designated by the Owner, shall observe the Work assigned for conformance with the approved design drawings and specifications. The Project Manager may order additional Special Inspections, testing, or approval, as required by the authority having jurisdiction by providing notice to the Contractor. The Contractor shall provide notification and coordination for additional Special Inspections as provided in subparagraph 7.7.1. If such special inspection or testing reveals a failure of the Work to comply (1) with the requirements of the Contract Documents, or (2) with respect to the performance of the Work, with laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction, the Contractor shall bear all costs thereof, including compensation of the Owner's administrative and legal expenses, and for the Architect's, the Project Manager's, and the Special Inspector's additional services made necessary by such failure.
- 7.7.3 Inspections and Tests required to establish compliance with the Contract Documents, as provided for in the Contract Documents, will be made by a qualified, independent testing agency approved by the Owner. The cost of the services of such agency will be paid by the Contractor, unless otherwise provided in the Contract Documents. When the initial tests indicate non-compliance with the Contract Documents, any subsequent retesting occasioned by non-compliance shall be performed by the same agency and the costs thereof borne by the Contractor. The Contractor shall provide facilities for such access to the Work in order that the agency may properly perform its functions. Representatives of the testing agency shall have access to the Architect, Project Manager, or Owner at all times.
- 7.7.4 Inspections or testing performed exclusively for the Contractor's convenience shall be the sole cost and responsibility of the Contractor.
- 7.7.5 The independent testing agency, employed as specified in the Technical portion of these specifications, shall prepare the test reports, logs, and certificates applicable to the specific inspections and tests and shall deliver, immediately or within forty-eight (48) hours, as applicable, the specified number of copies of same to the designated parties. Other required certificates of inspection, testing or approval shall be secured by the Contractor and delivered by him to the Project Manager and the Architect, in such time as to not delay progress of the Work or final payment therefor.
- 7.7.6 If the Architect, the Project Manager or the Special Inspector is to observe the inspections, tests or approvals required by the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction or that are required to establish compliance with the Contract Documents, he will do so promptly and, where

practicable, at the normal place of testing.

7.7.7 Unless otherwise stipulated in the Contract Documents, the Contractor shall pay for all utilities required for testing of installed equipment of all of his Work and work of each Subcontractor furnishing equipment. Labor and supervision required for making such tests shall be provided at no additional cost to the Owner.

7.7.8 Owner may provide Quality Assurance testing. Contractor shall provide knowledgeable support personnel and cooperate fully with Owner's designated representative in conducting all Quality Assurance tests. If project fails tests, Contractor shall make all necessary corrections to meet test criteria and pay the Owner for all costs associated with additional tests.

7.8 ALTERNATES

7.8.1 Alternates may be either additive or deductive.

7.8.2 Alternates, if taken, may be taken in any sequence.

7.8.3 The Contractor shall include in his bid, or bid proposal, a bid for all alternates listed in the Bid Form. These alternates shall include the Contractor's net cost of the labor, materials, overhead and profit, and equipment necessary to perform or delete, the Work as outlined by such alternates.

7.9 UNENFORCEABILITY OF ANY PROVISION

7.9.1 If any provision of the Contract is held as a matter of law to be unenforceable, the remainder of the Contract shall be enforceable without such provision.

7.10 NO WAIVER BY OWNER

7.10.1 The failure of the Owner in any one or more instances to insist upon the strict performance of any of the terms of this Contract or to exercise any option herein conferred, shall not be construed as a waiver or relinquishment to any extent of the right to assert or rely upon such terms or option on any future occasion.

7.11 ASSIGNMENT OF CONTRACT

7.11.1 The Contractor shall not assign the responsibilities of this Contract, either as a whole or in part, nor assign any monies due or to become due to it hereunder, without previous written consent of the Owner.

END OF ARTICLE 7

ARTICLE 8

TIME

8.1 DEFINITIONS

- 8.1.1 Unless otherwise provided, the Contract Time is the period of time allotted in the Contract Documents for Substantial and Final Completion of the Work as defined in Subparagraph 8.1.3, including authorized adjustments thereto.
- 8.1.2 The date of execution of the Contract Agreement between the Owner and Contractor shall be subsequent to School Board Approval and the Contractor's satisfactory submittals to the Owner of the Certificate of Insurance, the Performance Bond and the Payment Bond as noted in the Invitation to Bidders. The Owner will issue a Notice to Proceed no later than ten (10) days from execution of the Owner-Contractor Agreement by both Owner and Contractor. The date of commencement of the Work shall be the date established by the Notice to Proceed. The Owner shall not be responsible for any costs incurred by the Contractor prior to the Notice to Proceed.
- 8.1.3 The Date of Substantial Completion of the Work or designated portion thereof is the Date certified by the Project Manager and Architect when the Work or a designated portion thereof is sufficiently complete, in accordance with the Contract Documents, so the Owner can fully occupy and utilize the Work or designated portion thereof for the use for which it is intended, with all of the Project's parts and systems cleaned and operable as required by the Contract Documents. Only incidental corrective work and any final cleaning beyond that needed for the Owner's full use may remain for Final Completion.
- 8.1.4 The term day as used in the Contract Documents shall mean calendar day unless otherwise specifically designated. All dates shall mean 12:01 a.m. of the indicated day unless otherwise stipulated.
- 8.1.5 The term "working day" as may be used in the Contract Documents shall mean any day not otherwise defined herein as a non-working day.
- 8.1.6 The term non-working day as may be used in the Contract Documents shall mean Sunday, a recognized holiday, a day on which the Contractor is specifically required to suspend construction operations or a day on which a suspension order is in effect. Recognized holidays shall be: New Year's Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, Christmas Eve (half day), and Christmas Day. When any of the above days fall on a Saturday, the preceding Friday shall be counted as a holiday. When any of the above days fall on a Sunday, the following Monday shall be counted as a holiday.
- 8.1.7 The term "Beneficial Occupancy" is interchangeable with the term Substantial Completion.

8.2 PROGRESS AND COMPLETION

- 8.2.1 All times stated in the Contract Documents are of the essence of the Contract.
- 8.2.2 The Contractor shall begin the Work on the date of commencement as defined in Subparagraph 8.1.2. He shall carry the Work forward expeditiously with adequate forces and shall achieve Substantial Completion and Final Completion in accordance with the Project Schedule Milestone Dates set forth under Section 00200 hereof.
- 8.2.3 Attention is directed to the fact that the Work is urgently needed by the Owner and that time is of the essence; for this reason, it shall be agreed that the Contractor shall

substantially complete all Work under the Contract in accordance with the Project Schedule Milestone Dates set forth under Section 00200 hereof and, that he will complete the contract in all its details for final acceptance as specified after Substantial Completion.

8.3 DELAYS AND EXTENSIONS OF TIME

- 8.3.1 The Contractor shall be entitled to extensions in the time required for performance of the Work as specifically provided in the Contract. Except as otherwise specifically provided under Paragraph 3.4., 12.1, or 8.3.5, the Contractor shall not be entitled to payment or compensation of any kind from the Owner for direct, indirect, impact or consequential damages, including but not limited to costs of acceleration because of hindrance or delay or loss of labor or equipment efficiency or productivity arising out of any hindrance, interference, obstruction, disruption or delay from any source or cause whatsoever, whether such hindrance, interference, obstruction, disruption or delays be reasonable or unreasonable, foreseeable or unforeseeable, or avoidable or unavoidable.
- 8.3.2 The Contract Time may be adjusted only for changes pursuant to Paragraph 12.1, suspension of Work pursuant to Paragraph 3.4. and delays pursuant to Subparagraph 8.3.3.
- 8.3.3 Types of delay shall be defined as follows:
- 8.3.3.1 Actions or inactions of the Owner, or events for which the Owner has assumed contractual responsibility, which would independently delay the date of Substantial Completion beyond the current contractually established date of Substantial Completion shall be designated as Compensable delays.
- 8.3.3.2 Events which are outside the control of, and without the fault or negligence of either the Owner or the Contractor, which would independently delay the date of Substantial Completion beyond the current Contract Completion Date shall be designated as Excusable delays, as follows:
- 8.3.3.2.1 Labor disputes and strikes (including strikes affecting transportation), that do, directly and critically affect the progress of the Work; however, any extension of Contract Time on account of an individual labor strike shall not exceed the number of days of said strike.
- 8.3.3.2.2 Acts of God, tornado, fire, hurricane, blizzard, earthquake, typhoon, or flood that damage completed work or stored materials.
- 8.3.3.2.3 The Contract Time will not be extended due to normal inclement weather. Unless the Contractor can substantiate to the satisfaction of the Owner that the weather actually encountered by the Contractor was unusually severe considering the full term of the Contract Time using a ten (10) year average of accumulated record mean values from climatological data compiled by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration for the locale of the Project and that such alleged substantially greater than normal inclement weather actually delayed the Work or portions thereof which had an effect upon the Contract Time, the Contractor shall not be entitled to an extension of time.

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- 8.3.3.2.4 Acts of the public enemy, acts of the state, federal or local government in its sovereign capacity, and acts of another contractor in the performance of a contract with the Owner relating to the Project.
- 8.3.3.3 Actions or inactions of the Contractor, or events for which the Contractor has assumed contractual responsibility, which would independently delay the date of Substantial Completion beyond the current Contract Completion Date shall be designated as Non-excusable delays.
- 8.3.3.4 Concurrent delay is any combination of the above three types of delay occurring on a calendar date, except in cases where the combination consists of two or more instances of the same type of delay occurring on a calendar date.
- A delay to the Contractor caused by the acts of another contractor under contract to the Owner will be classified as a compensable delay to the extent said delay meets the requirements of compensable delay as set forth under Subparagraph 8.3.3.1. Also, it is the Owner's belief that the definitions of delay as included in this paragraph comply with all applicable law in the State of Alaska.
- 8.3.4 Any claim for extension of time shall be made in writing to the Project Manager not more than seven (7) calendar days after commencement of the delay; otherwise it shall be waived. The Contractor shall also provide an estimate of the probable effect of such delay on the progress of the Work. In the case of a continuing delay only one claim is necessary. Any event, action, inaction, or other cause which may give rise to a delay shall constitute a basis for adjustment in:
- 8.3.4.1 Contract Time, only if it can be demonstrated that the date of Substantial Completion will be delayed beyond the current Contract Completion Date and that the delay is classified as only a Compensable, Excusable, or Concurrent Delay. The Contract Time shall be adjusted by Change Order pursuant to the requirements of Paragraph 8.3 and Division 1, Section 01311; or
- 8.3.4.2 Contract Amount, only if it can be demonstrated that the Contractor's time-related costs to complete the Work will be increased and the delay is classified as only a Compensable Delay. The Contract Sum shall be adjusted by Change Order pursuant to the requirements of Subparagraphs 8.3 and 12.3.
- 8.3.5 All time limits stated in the Contract Documents are of the essence of this Contract. The failure of the Contractor to complete the Work in conformance with the Contract shall result in damages suffered by the Owner due to delays in completion of the Work.
- 8.3.5.1 If the Contractor fails to substantially complete the Work in conformance with the Contract Documents and the Owner nevertheless permits the Contractor to continue performance of the Work, such permission shall neither modify nor waive the Owner's right to assess and collect, and the Contractor's obligation to pay liquidated damages.
- 8.3.5.2 The Owner shall be entitled to claim against the Contractor for any liquidated damages incurred. The Owner cannot anticipate at this time what liquidated damages may occur or what the per diem cost of these damages might be. Determination of liquidated damage details will be a matter of proof should the issue arise.

- 8.3.5.3 The Owner shall recover said liquidated damages by deducting the amount thereof from any monies due or that may become due the Contractor. In the event the remaining balance due the Contractor is insufficient to cover the full amount of assessed damages, then the Contractor or his Surety shall pay the amount due and the Owner shall be entitled to any and all rights and remedies available to it in law or equity to recover same.

8.4 RESPONSIBILITY FOR COMPLETION

- 8.4.1 The Contractor shall furnish such manpower, materials, facilities and equipment and shall work such hours, including night shifts, overtime operations and Sundays and holidays, as may be necessary to insure the progress and completion of the Work in accordance with the accepted and currently updated progress schedule. If Work actually in place falls behind the currently updated and accepted progress schedule and it becomes apparent from the current schedule that the Work will not be completed in accordance with the Contract Time, the Contractor agrees that he will, as necessary, take some or all of the following actions at no additional cost to the Owner, as required to substantially eliminate the schedule slippage deficiency:
- 8.4.1.1 Increase manpower in such quantities and crafts as will substantially eliminate in the opinion of the Project Manager the schedule slippage deficiency;
- 8.4.1.2 Increase the number of working hours per shift, shifts per working day, working days per week, or the amount of equipment, or any combination of the foregoing sufficiently to substantially eliminate, in the opinion of the Project Manager the schedule slippage deficiency; and,
- 8.4.1.3 Reschedule activities to achieve maximum practical concurrence of accomplishment of activities.
- 8.4.2 The Project Manager may require the Contractor to submit a recovery schedule in accordance with Section 01311 of the Specifications, demonstrating his program and proposed plan to make up the slippage in scheduled progress and to ensure completion of the Work in accordance with the requirements of the Contract. If the Project Manager finds the proposed plan not acceptable, he may require the Contractor to submit a new plan. If the actions taken by the Contractor or the second plan proposed are not satisfactory, the Project Manager may require the Contractor to take any of the actions set forth in this Paragraph 8.4 without additional cost to the Owner, to make up the slippage in scheduled progress.
- 8.4.3 Failure of the Contractor to substantially comply with the requirements of this Paragraph 8.4 may be considered grounds for a determination by the Owner, pursuant to Clause 14.1, that the Contractor is failing to prosecute the Work with sufficient diligence to ensure its in accordance with the Project Milestone Dates set forth under Section 00200 hereof.

END OF ARTICLE 8

ARTICLE 9

PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

9.1.1 The Contract Sum is stated in the Owner-Contractor Agreement and, including authorized adjustments thereto, is the total amount payable by the Owner to the Contractor for the performance of the Work under the Contract Documents.

9.2 SCHEDULE OF VALUES

9.2.1 Before the first Application for Payment, the Contractor shall submit to the Owner, through the Project Manager, a schedule of values allocated to the various portions of the Work, as set forth in Division 1, Section 01370 of the General Requirements entitled "Schedule of Values" and supported by such data to substantiate its accuracy as the Architect, Project Manager and the Owner may require. This schedule, unless objected to by the Architect, Owner, or Project Manager, may be used as a basis for the Contractor's Applications for Payment except as otherwise noted under Division 1, Section 01311. The Schedule of Values shall be prepared in such a manner that each major item of work and each subcontracted item of work is shown as a single item on the Application and Certificate of Payment.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 Prior to the date for each progress payment established in the Contract Documents, the Contractor, in accordance with Division 1, Section 01311 of the General Requirements entitled "Project Schedule," shall submit to the Project Manager an itemized Application for Payment, notarized if required, supported by such data substantiating the Contractor's right to payment as the Project Manager and the Architect may require, and reflecting retainage, if any, as provided elsewhere in the Contract Documents. The form of Application for Payment shall be Anchorage School District Forms 100, 100A, 100B and 100C and the computer-produced Cost Report updated in accordance with Division 1, Section 01311.

9.3.2 If the Project Manager finds that satisfactory progress is not being made, he may require retainage of up to 10% of the total amount earned on all subsequent progress payments. This retainage may be released at such time as the Project Manager finds that satisfactory progress is being made.

9.3.3 Payments may be authorized by the Project Manager at his discretion, on account of materials or equipment not incorporated in the Work but delivered and suitably stored at the site by the Contractor. Payments for materials or equipment stored on the site shall only be considered upon submission by the Contractor of satisfactory evidence that he has acquired title to such material, that it will be utilized on the Work under this Contract and that it is satisfactorily stored, protected, and insured or that other procedures satisfactory to the Project Manager that will protect the Owner's interests have been taken.

9.3.4 The Contractor warrants that title to all Work, materials and equipment covered by an Application for Payment will pass to the Owner either by incorporation in the construction or upon the receipt of payment by the Contractor, whichever occurs first, free and clear of all liens, claims, security interests or encumbrances, hereinafter referred to in this Article 9 as "liens"; and that no Work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing Work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise

imposed by the Contractor or such other person.

9.4 APPROVAL OF PAY APPLICATION

- 9.4.1 The Project Manager will, after receipt of the Contractor's Application for Payment, and within the time set forth in Division 1, Section 01311 of the General Requirements entitled "Project Schedule," either approve the Application for its full amount or notify the Contractor in writing of his reasons for withholding approval, in whole or in part, as provided in Subparagraph 9.6.1.
- 9.4.2 The submission and acceptance of the Contractor's Preliminary and Detailed Progress Schedules and monthly updates thereof as required by Division 1, Section 01311 of the General Requirements entitled "Project Schedule," shall be an integral part and basic element of the application upon which progress payments shall be made. If in the judgment of the Project Manager the Contractor fails or refuses to provide information required to accomplish a complete Project Schedule Update or revision thereto as specified under Division 1, Section 01311 of the General Requirements, the Contractor shall be deemed to have not provided the information necessary to enable the Project Manager and the Architect to properly evaluate the Contractor's progress, and shall not be entitled to progress payments until it has furnished the information necessary for a complete Project Schedule Update or revision thereto as specified herein to the satisfaction of the Project Manager.
- 9.4.3 The signing of an Application for Payment will constitute a representation by the Project Manager and the Architect, based on their observations at the site and the data comprising the Application for Payment, that the Work has progressed to the point indicated; that, to the best of their knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to the results of any subsequent tests required by or performed under the Contract Documents, to minor deviations from the Contract Documents correctable prior to completion, and to any specific qualifications stated in their Certificate); and that the Contractor is entitled to payment in the amount certified. However, by approving an Application for Payment, the Project Manager and the Architect shall not thereby be deemed to represent that either has made exhaustive or continuous on-site inspections to check the quality or quantity of the Work or that either has reviewed the construction means, methods, techniques, sequences or procedures, or that either has made an examination to ascertain how or for what purpose the Contractor has used the monies previously paid on account of the Contract Sum.

9.5 PROGRESS PAYMENTS

- 9.5.1 After an Application for Payment has been approved, the Owner shall make payment within thirty (30) calendar days.
- 9.5.2 The Contractor shall promptly pay each Subcontractor (including suppliers, laborers, and material-men) performing labor or furnishing material for the Work, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's Work, the amount to which said Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such Subcontractor's Work. The Contractor shall, by an appropriate agreement with each Subcontractor, also require each Subcontractor to make payments to his Sub-subcontractors in similar manner.
- 9.5.3 The Owner may, on request and at his discretion, furnish to any Subcontractor, Sub-subcontractor, or Material Supplier and Vendor, if practicable information regarding the

percentages of completion or the amounts applied for by the Contractor and the action taken thereon by the Project Manager on account of Work done by such Subcontractor, Sub-subcontractor, or Material Supplier or Vendor.

- 9.5.4 Neither the Owner, the Project Manager, nor the Architect shall have any obligation to pay or to see to the payment of any monies to any Subcontractor except as may otherwise be required by law.
- 9.5.5 No approval for a progress payment, nor any progress payment, nor any partial or entire use of occupancy of the Project by the Owner, shall constitute an acceptance of any Work not in accordance with the Contract Documents.
- 9.5.6 The Contractor agrees to keep the Work and the site(s) on which Work is to be performed free and clear of all liens and claims of liens on materials furnished pursuant to the Contract Documents. Contractor hereby waives any right it may have in connection with the Work to file any liens, mechanics or otherwise. Notwithstanding anything to the contrary contained in the Contract Documents, if any such lien is filed or there is any reason to believe that any lien may be filed at any time during the progress of the Work or within the duration of this Contract, the Owner may refuse to make any payment otherwise due to Contractor or withhold from any payment due the Contractor a sum sufficient in the opinion of the Owner to pay all obligations and expenses necessary to satisfy such lien or claim and completely indemnify the Owner against any such lien or claim unless and until Contractor shall thereof, if any, has been satisfied, discharged and released of record or that the Contractor has caused such lien to be released or record if and as provided by law pending the resolution of any dispute between Contractor and the person filing such lien; and if such evidence is not furnished by Contractor to the Owner within a period of five (5) days after demand to do so, the Owner may discharge such indebtedness and deduct the amount required therefore, together with any and all losses, costs, damages and attorney's fees suffered or incurred by the Owner from any sum payable to Contractor under the Contract Documents. Final payment to Contractor may be withheld until the Work and the site(s) on which the Work is to be performed are free and clear of any and all liens for rights thereto arising because of Work performed or materials furnished under the Contract Documents. This Subparagraph 9.5.6 shall be specifically included in all subcontracts and purchase orders entered into by Contractor.
- 9.5.7 No reference to a claim or claims of lien or to the Owner's right to withhold payments to the Contractor or to discharge the Contractor's debts to Subcontractors, in Subparagraph 9.5.6, or elsewhere in the Contract Documents, shall be interpreted as a waiver of the Owner's right to exemption pursuant to AS 09.38.015(c) or any requirements with regard to the filing of claims of lien as set forth in AS 34.35.

9.6 PAYMENTS WITHHELD

- 9.6.1 The Architect and the Project Manager may decline to approve an Application for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in their opinion they are unable to make representations to the Owner as provided in Subparagraph 9.4.3. If the Project Manager and the Architect are unable to make representations to the Owner as provided in Subparagraph 9.4.3 and to certify payment in the amount of the Application, they will notify the Contractor as provided in Subparagraph 9.4.1.

If the Contractor, Project Manager and the Architect cannot agree on a revised amount, the Project Manager will promptly approve the Application for Payment for the amount for which he is able to make such representations to the Owner. The Project Manager may also decline to certify payment or, because of subsequently discovered evidence or

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subsequent observations, he may nullify the whole or any part of any approval of an Application for Payment previously issued to such extent as may be necessary in his opinion to protect the Owner from loss because of:

- 9.6.1.1 Defective work not remedied,
 - 9.6.1.2 Third-party claims filed or reasonable evidence indicating probable filing of such claims,
 - 9.6.1.3 Failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment,
 - 9.6.1.4 Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum,
 - 9.6.1.5 Damage to the Owner or another contractor,
 - 9.6.1.6 Reasonable evidence that the Work will not be completed within the Contract Time,
 - 9.6.1.7 Failure or refusal of the Contractor to carry out the Work in accordance with the Contract Documents, including scheduling, project management, or coordination requirements,
 - 9.6.1.8 Liens filed for any portion of the Work, or
 - 9.6.1.9 Failure or refusal of the Contractor to fully comply with Division 1, Section 01311 of the General Requirements entitled "Schedules and Reports".
- 9.6.2 When the above grounds in Subparagraph 9.6.1 are removed, payment shall be made for amounts withheld because of them.

9.7 FAILURE OF PAYMENT

- 9.7.1 If the Owner does not pay the Contractor within seven (7) days after the date established in the Contract Documents any amount certified by the Architect and the Project Manager, then the Contractor may, upon seven (7) additional days' written notice to the Owner and the Architect, stop the Work until payment of the amount not in dispute has been received. The Contractor shall not refuse or fail to diligently proceed with the Work pending the resolution of any amount(s) in dispute unless agreed to by the Owner.

9.8 SUBSTANTIAL COMPLETION

- 9.8.1 When the Contractor considers that the Work, or a designated portion thereof which is acceptable to the Owner, is substantially complete as defined in Subparagraph 8.1.3, the Contractor shall prepare for submission to the Project Manager a list of items to be completed or corrected. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. When the Architect and the Project Manager on the basis of an inspection jointly determine that the Work or designated portion thereof is substantially complete, the Architect will then prepare a Certificate of Substantial Completion which shall establish the Date of Substantial Completion, shall state the responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, correction of punchlist items and damage to the Work, and insurance, and shall fix the time within which the Contractor shall complete the items listed therein. Warranties required by the Contract Documents shall

commence on the Date of Substantial Completion of the work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance of the responsibilities assigned to them in such Certificate.

- 9.8.2 Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and certification by the Project Manager and the Architect, the Owner shall make payment, reflecting adjustment in retainage, if any, for such Work or portion thereof, as provided in the Contract Documents.
- 9.8.3 The acceptance of Substantial Completion payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and identified by the Contractor as unsettled at the time of the Application for Payment for Substantial Completion, and except for the retainage sums due at final acceptance if any.

9.9 FINAL COMPLETION AND FINAL PAYMENT

- 9.9.1 Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect and the Project Manager will promptly make such inspection and, when they find the Work acceptable under the Contract Documents and the Contract fully performed, they will jointly issue a final Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their observations and inspections, the Work has been completed in accordance with the terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor, as noted in said final Certificate, is due and payable. The final Certificate for Payment will constitute a further representation that the conditions precedent to the Contractor's being entitled to final payment as set forth in Subparagraph 9.8.2 have been fulfilled.
- 9.9.2 Neither the final payment nor the remaining retained percentage shall become due until the Work is free and clear of any and all liens and the Contractor submits to the Owner (1) an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or his property might in any way be responsible, have been paid or otherwise satisfied, (2) consent of surety, if any, to final payment and (3), if required by the Project Manager, other data establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of liens arising out of the Contract, to the extent and in such form as may be designated by the Project Manager. If any Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify him against any loss. If any such lien or claim remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such lien or claim, including all costs and reasonable attorney's fees. The Owner may withhold from the final payment any sum that the Owner has reason to believe may be needed to satisfy any lien, claim or threat of lien arising from the Work. The Owner may deduct from the final payment an amount equal to any costs, expenses and attorneys' fees incurred by the Owner in removing or discharging any liens arising from the Work.
- 9.9.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor, or by the issuance of change orders affecting final completion, and the Owner so confirms, the Owner shall, upon application by the Contractor and certification by the Project Manager and the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than the retainage stipulated in the Contract Documents, and if bonds have been furnished as provided in Paragraph 7.5, the written consent of the surety to the

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payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Project Manager prior to certification of such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

- 9.9.4 The making of final payment shall constitute a waiver of all claims by the Owner against the Contractor except those arising from:
- 9.9.4.1 Unsettled liens, and claims against the Owner, the Project Manager, or the Architect, or their employees, agents, or representatives,
 - 9.9.4.2 Faulty or defective Work appearing after Substantial Completion,
 - 9.9.4.3 Failure of the Work to comply with the requirements of the Contract Documents,
 - 9.9.4.4 Terms of any warranties contained in or required by the Contract Documents,
 - 9.9.4.5 Liquidated damages due the Owner for the Contractor's delay in completion, or
 - 9.9.4.6 Damages incurred by the Owner resulting from lawsuits brought against the Owner, the Project Manager, the Architect, or their agents, employees or representatives because of failures or actions on the part of the Contractor, his Subcontractors, Sub-subcontractors, Material Suppliers and Vendors, or any of their employees, agents or representatives.
- 9.9.5 The acceptance of final payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and identified by the Contractor as unsettled at the time of the final Application for Payment.
- 9.9.6 Final Completion includes, but is not limited to, the Contractor obtaining an unconditional Certificate of Occupancy from the governing building official.
- 9.10 OWNER'S RIGHT TO OCCUPY INCOMPLETE WORK
- 9.10.1 Should the Project, or any portion thereof, be incomplete for Beneficial Occupancy or Final Completion at the scheduled date or dates, the Owner shall have the right to occupy any portion of the Project. In such an event, the Contractor shall not be entitled to any extra compensation on account of said occupancy by the Owner or by the Owner's normal full use of the Project, nor shall the Contractor interfere in any way with said normal full use of the Project. Further, in such an event, the Contractor shall not be entitled to any extra compensation on account of the Owner's occupancy and use of the Project, nor shall the Contractor be relieved of any responsibilities of the Contract including the required times of completion. Such occupancy by the Owner would not, in itself, constitute Beneficial Occupancy nor Final Completion.
- 9.10.2 If the Owner exercises his rights under the foregoing and occupies the full project, then there shall be no liquidated damages due to delay on account of failure on the Contractor's part to provide Beneficial Occupancy from that date forward. This provision does not affect, however, any damages due to delay that would be assessed for any period of time between the scheduled date of Beneficial Occupancy and the date of any such actual occupancy. Further, this provision would have no effect on actual damages assessed on account of late Final Completion.

9.11 RETENTION AND INSPECTION OF RECORDS

9.11.1 Inspection.

The Anchorage School District, or any of its duty authorized representatives, shall have the right to examine all project records and documents, including without limitation, all books, correspondence, reports, analyses, instructions drawings, receipts, vouchers, memoranda, and all financial and accounting books, records, and data and all other documents of both the Contractor and the Contractors, Subcontractors and any Sub-subcontractors which are directly pertinent to this specific Contract for the purpose of making an audit, examination, reproduction, excerpts, or transcriptions. All required records shall be retained by the Contractor and its first tier Subcontractors for three (3) years after the Owner makes final payments and all other pending matters are closed.

9.11.2 Retention and Maintenance.

The Contractor shall keep and maintain in safe condition full and accurate records of all costs incurred and items billed and all other project records and documents relating to performance, communications, and correspondence in connection with the performance of the Work under this Contract, which records and documents shall be open to review, examination or audit by the Owner or its authorized representatives during performance of the Work and until three (3) years after Final Payment and all other pending matters are closed.

9.11.3 Subcontractor Records.

The Contractor shall make it a condition of all subcontracts and sub-subcontracts relating to the Work under this Contract that any and all Subcontractors and sub-subcontractors will keep accurate records of costs incurred and items billed in connection with their work and that such records shall be open to review, examination, reproduction or audit by the Owner or its authorized representatives during performance of the Work and until three (3) years after Final Payment under the subcontract and all other pending matters are closed.

9.11.4 Availability.

The Contractor shall make available at its business office upon request at all reasonable times the materials described in this Article including materials of both the Contractor and its first tier Subcontractors, for review, examination reproduction or audit for a period of three (3) years after Final Payment under this Contract and all other pending matters are closed.

9.11.5 Termination.

If this Contract is completely or partially terminated, the records relating to the Work terminated shall be made available for three (3) years after any resulting final termination settlement.

9.11.6 Claims and Appeals.

Records pertaining to any settlement, mediation, arbitration, litigation or appeals of claim submitted pursuant to Paragraphs 12.4 or 12.5 or otherwise arising from or relating to the performance of Work under this Contract shall be made available until such settlement, mediation, arbitration, litigation, or appeals are finally concluded. Such documents or records shall be made available to the Anchorage School District or its duty authorized representatives within thirty (30) days of the Anchorage School District's request.

9.11.7 Subcontracts.

The Contractor shall include the provisions of this Article in all first tier Subcontracts so as to be binding on all first tier Subcontractors.

9.11.8 Cost or Pricing Data.

If the Contractor has submitted cost or pricing data in connection with the pricing of any change order or modification to this Contract - unless the pricing was based on—

- 9.11.8.1 adequate price competition, or
- 9.11.8.2 established catalog or market price of commercial items sold in substantial quantities to the general public; or
- 9.11.8.3 prices set by law or regulation -

the Anchorage School District or a representative who is an employee of the Anchorage School District, shall have the right to examine and audit all books, records, documents, and other data of the Contractor, including computations and projections, related to negotiating, pricing, or performing the change order or modification, in order to evaluate the accuracy, completeness, and currency of the cost or pricing data.

END OF ARTICLE 9

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 The Owner, the Project Manager, the Architect, or their agents, employees or representatives are not responsible for the means, methods, techniques, sequences or procedures utilized by the Contractor, or for safety precautions and programs in accordance with the Work. The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

10.2.1.1 All employees on the Work and all other persons who may be affected thereby;

10.2.1.2 All the Work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any of his Subcontractors or Sub-subcontractors; and

10.2.1.3 Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

10.2.2 The Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss.

10.2.2.1 The Contractor shall contact the State Historic Preservation Office (907-269-8700) immediately, should cultural or paleontological resources be discovered as a result of performing the Work.

10.2.3 The Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.

10.2.4 When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

10.2.5 The Contractor shall promptly remedy all damage or loss to any property referred to in paragraphs 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, any Subcontractor, any Sub-subcontractor, any Material Supplier or Vendor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable and for which the Contractor is responsible under paragraphs 10.2.1.2 and 10.2.1.3, except damage or loss attributable to the acts or omissions of the Owner, Project Manager or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to his obligations under Paragraph 4.18.

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- 10.2.6 The Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner through the Project Manager.
- 10.2.7 The Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.
- 10.2.8 Following the Notice to Proceed, the Contractor is required to obtain facility keys and the security system access code from ASD Operations Department and obtain the facility keys by contacting the Project Manager.
- 10.2.8.1 A unique security code will be assigned to the Contractor. The ASD Operations office, 1301 Labar, will assign the code and provide access training.
- 10.2.8.2 The Contractor's signature on the key receipt acknowledges liability for the Owner's loss or damage due to unauthorized access with the facility key(s) and/or access code issued to the Contractor. The Contractor's Superintendent is solely responsible for opening and closing of the facility.
- 10.2.8.3 Lost or stolen key(s) issued to the Contractor are to be reported immediately to the Project Manager. A written report shall be required for each incident.
- 10.2.8.4 Upon completion of the Project and prior to final payment, the Contractor will return all key(s) to the Project Manager. The following per facility charges will apply to any key not returned to the Project Manager.

<u>Facility Type</u>	<u>Charge</u>
Elementary School	\$5,000
Junior High/Middle School	\$7,000
Senior High School	\$10,000
Other ASD Facilities	\$5,000

10.3 EMERGENCIES

- 10.3.1 In any emergency affecting the safety of persons or property, the Contractor shall act, at his discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency work shall be determined as provided in Article 8 for Time, and Article 12 for Changes in the Work.

END OF ARTICLE 10

ARTICLE 11

INSURANCE

11.1 GENERAL

11.1.1 Before signing this Contract, or commencing work on any project or allowing any Subcontractor to commence work, the Contractor shall obtain all insurance required under this section. The Contractor shall maintain this insurance until Final Acceptance. Proof of Insurance will be required prior to performing work under the warranty. The Contractor shall file with Owner as verification of insurance, an original signed certificate of insurance showing the type and amounts of insurance, the policy number, and expiration date. The Contractor shall provide copies of each insurance policy if requested by the Owner. The Contractor shall purchase insurance from companies reasonably acceptable to the Owner and authorized to do business in the State of Alaska, possessing a Best's policyholder's rating of A- or better and a financial rating of not less than VII.

11.2 WORKERS' COMPENSATION INSURANCE

11.2.1 The Contractor shall purchase and maintain during the life of this Contract, Workers' Compensation Insurance for all employees who will work on this project and if any work is sublet, the Contractor shall require the Subcontractor to provide similar Workers' Compensation Insurance for employees. Such workers' compensation insurance shall meet the statutory requirements of the State of Alaska.

11.3 PUBLIC AND EMPLOYER LIABILITY INSURANCE

11.3.1 The Contractor and his Subcontractors, if any, shall purchase and maintain such Public and Employer Liability Insurance as will protect the Contractor against loss which may result from claims for damages from operations under this Contract, whether such operations be those of the Contractor, a Subcontractor, or any person directly or indirectly employed by them. Such liability insurance shall have a scope of coverage at least as broad as the current ISO form # CG 0001 (occurrence version) for General Liability and the current ISO form # CA 0001 for Automobile Liability, and in minimum limits specified in Paragraph 11.3.2.

11.3.2 Public and Employer Liability Insurance Requirements

11.3.2.1 Commercial General Liability

Combined Single Limit \$1,000,000
Annual Aggregate \$2,000,000

11.3.2.2 Comprehensive Auto Liability

Including all owned, hired and non-owned vehicles.
Combined Single Limit \$1,000,000 each accident

11.3.2.3 Employer's Liability Insurance

\$1,000,000 limit

11.3.3 Umbrella Liability

11.3.3.1 The Contractor shall maintain an umbrella liability policy according to the following:

Projects < \$10 million construction cost – \$5,000,000 per occurrence and annual aggregate.

Projects > \$10 million construction cost – \$10,000,000 per occurrence and annual aggregate.

This requirement does not apply to Subcontractors.

11.3.3.2 Umbrella liability insurance shall be maintained in effect until final acceptance by the Owner of the completed construction, and for products liability and completed operations liability, a minimum of two years thereafter.

11.4 BUILDERS RISK INSURANCE

11.4.1 The Contractor shall purchase and maintain an all risk Builder's Risk policy on all construction projects. The Builders Risk coverage shall be in an amount equal to the initial contract, plus any contract modifications, and the cost of materials supplied or installed by others. Perils insured must be all physical loss and will include earthquake, flood, testing and startup, resultant damage from errors in design, plans or specifications, and transit and offsite storage.

11.4.2 A loss insured under Subparagraph 11.4.1 shall be adjusted by the Insurer, or by the Contractor as Fiduciary, and made payable to the Contractor as Fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Subparagraph 11.4.5. The Contractor shall pay each Subcontractor a just share of any insurance monies received by the Contractor, and by appropriate agreement, written where legally required for validity, shall require each Subcontractor to make payments to his Sub-subcontractors in similar manner.

11.4.3 The Owner and Contractor shall waive all rights against each other for damages caused by fire or other perils to the extent covered by insurance obtained pursuant to this Paragraph 11.4 or any other property insurance applicable to the Work, except such rights as they may have to the proceeds of such insurance held by the Contractor as Fiduciary. The Contractor shall require, by appropriate agreement, written where legally required for validity, similar waivers in favor of the Owner and the Contractor by Subcontractors and Sub-subcontractors. With respect to the waiver of rights of recovery, the term Owner shall be deemed to include, to the extent covered by property insurance applicable thereto, his consultants, employees, agents and representatives, including the Project Manager. The Contractor waives as against any separate Contractor described in Article 6 all rights for damages caused by fire or other perils in the same manner as is provided above as against the Owner. The Owner shall require, by appropriate agreement, written where legally required for validity, similar waivers in favor of the Contractor by any separate Contractor and his Subcontractors and Sub-subcontractors.

11.4.4 If required in writing by any party in interest, the Contractor as Fiduciary shall, upon the occurrence of an insured loss, give bond for the proper performance of his duties. He shall deposit in a separate account any money so received, and he shall distribute it in accordance with a court order or award. If after such loss no other special agreement is made, replacement of damaged work shall be covered by an appropriate Change Order.

11.4.5 The Contractor as Fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within five (5) days after the occurrence of loss to the Owner's exercise of this power, and if such objection is made, the matter shall be decided by a court of competent jurisdiction or as parties in interest otherwise agree. The Contractor as Fiduciary shall, in that case, make settlement with the insurers accordingly.

11.4.6 If the Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion thereof, such occupancy shall not commence prior to a time mutually agreed to by the Owner and Contractor and to which the insurance company or companies providing the property insurance have consented by endorsement of the policy or policies. This insurance shall not be canceled or lapsed on account of such partial occupancy. Consent of the Contractor and of the insurance company or companies to such occupancy or use shall not be unreasonably withheld.

11.5 CERTIFICATE OF INSURANCE REQUIREMENTS

11.5.1 Each insurance policy required in this section will be evidenced by a certificate of insurance which contains the following:

11.5.1.1 Notice of cancellation to the Anchorage School District in accordance with Alaska Statutes 21.36.220 and .260.

11.5.1.2 Contract number.

11.5.1.3 Project location.

11.5.1.4 Waiver of Subrogation. All policies, except where prohibited, will include a Waiver of Subrogation in favor of the District.

11.5.1.5 Additional Insured. All policies except Workers Compensation and professional liability will note the District as an additional insured.

11.6 OWNER'S RIGHT TO INSURE

11.6.1 In the event Contractor neglects, refuses, or fails to provide the insurance required under the Contract Documents, or if such insurance is canceled for any reason, the Owner shall have the right, but not the duty to procure the same, and the costs thereof shall be deducted from monies then due or thereafter to become due the Contractor.

11.7 ADDITIONAL INSURANCE

11.7.1 If not covered by the above insurance, the Contractor must obtain additional Insurance for items stored off-site or in transit. Payments for materials stored off-site will not be made unless Contractor provides documentation of valid insurance coverage for same.

11.8 ASBESTOS ABATEMENT SUBCONTRACTOR'S CERTIFICATE OF INSURANCE

11.8.1 After the Intent to Award Notification, the low bidder shall submit an insurance binder of insurance certificate provided by the proposed asbestos abatement subcontractor's insurance company stating that upon execution of the Contract the types and amount of insurance required elsewhere in these specifications will immediately become effective.

The asbestos abatement subcontractor is required to carry a minimum of \$1,000,000 of General Public Liability Insurance with no exclusion for asbestos abatement.

11.8.2 Comprehensive General Liability Minimum Limits

Bodily Injury and Property Damage \$2,000,000 per occurrence
Premises Operations
Independent Contractors
Products - Completed Operations
Contractual Liability
Broad Form Property Damage - Lloyds Form
Explosion, Collapse, and Underground
Personal Injury

11.8.3 Comprehensive Auto Liability

Including all owned, hired, and non-owned vehicles
Combined single limit per accident \$1,000,000

END OF ARTICLE 11

ARTICLE 12

CHANGES IN THE WORK AND CONTRACT SUM AND TIME

12.1 CHANGES IN THE WORK

12.1.1 The Owner may, at any time, without notice to the sureties, make any change in the Work within the general scope of the Contract, including, but not limited to changes:

12.1.1.1 In the Specifications or Drawings;

12.1.1.2 In the method or manner of performance of the Work;

12.1.1.3 In the Owner-furnished facilities, equipment, materials, services or site; or

12.1.1.4 Directing acceleration in the performance of the Work for reasons other than delays caused by the Contractor.

12.1.2 All such changes in the Work shall be performed under the applicable conditions of the Contract Documents and shall be authorized in one of the following manners:

12.1.2.1 Field Directive. The Project Manager may issue a written Field Directive to the Contractor that directs a change in the Work. If the Contractor believes that the requested change will increase the Contract Time or Contract Sum, he must notify the Project Manager in writing prior to implementing the change.

12.1.2.2 Information Bulletin. The Architect may issue an Information Bulletin to the Contractor that clarifies or modifies the plans or specifications. If the Contractor believes that the clarification or modification of plans or specifications will increase the Contract Time or Contract Sum, he must notify the Project Manager in writing prior to implementing the change.

12.1.2.3 Request for Information (RFI). The Contractor may submit a RFI to the Project Manager or Architect using the ASD Procore Construction Management Program to request clarification of plans or specifications or to point out areas of apparent conflict or other concerns relating to the Work. The response to the RFI by the Architect or Project Manager may clarify or modify the plans or specifications. If the Contractor believes that the clarification or modification of plans or specifications will increase the Contract Time or Contract Sum, he must notify the Project Manager in writing prior to implementing the change.

12.1.2.4 Request for Proposal (RFP). The Owner may issue an RFP to the Contractor that directs a change in the Work and requests the Contractor's evaluation of the impact of the change on Contract Time or Contract Sum. If the Contractor believes that the Work required by the RFP will increase the Contract Time or Contract Sum, he must notify the Project Manager in writing prior to implementing the changes.

12.1.3 Except as provided in Subparagraph 12.1.2, no order, statement or conduct of the Owner, Project Manager or Architect shall be treated as a change or entitle the Contractor to an equitable adjustment hereunder. No oral agreement of any kind shall be construed as a Change Order.

12.2 AMENDING CONTRACT SUM OR TIME

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- 12.2.1 If any change under Paragraph 12.1 causes an increase or decrease in the Contractor's cost or the time required for the performance of any part of the Work under the Contract, including Work not affected directly by the change, an equitable adjustment shall be processed and approved following the provisions of Division 1, Section 01311, Project Schedule for any adjustment to time. Adjustments to Contract Sum shall be determined in one or more of the following ways:
- 12.2.1.1 By mutual acceptance of a lump sum price properly itemized in accordance with Subparagraph 12.2.2 and supported by sufficient data to permit evaluation;
 - 12.2.1.2 In the event that unit prices are included in the bid and accepted by the Owner, payment for the Work performed shall be at the unit price amount for each item of Work accepted by the Owner and conforming to the contract requirements. Such prices shall be additive and deductive and include all costs necessary to complete the Work, inclusive of overhead costs and profit.
 - 12.2.1.3 If prior to the commencement of the Work the Contractor has not provided a lump sum price, or the Contractor and the Owner have not agreed on a lump sum price as described in Subparagraph 12.2.1.1 above, the price shall be established in one of the following ways, as determined by the Project Manager;
 - 1. on a lump sum basis following completion of the Work. The lump sum price shall be properly itemized in accordance with Subparagraph 12.2.2. and supported by sufficient data to permit evaluation;
 - 2. on a time and materials basis, with or without a maximum not-to-exceed price, at the discretion of the Project Manager. Costs will be accumulated on a time and materials basis as described in Subparagraph 12.2.3 and presented daily (the day after the Work is performed) for approval by the Owner on the forms provided by the Owner. The daily report will be signed by the Contractor and the Owner.
- 12.2.2 For Work proceeding on a lump sum basis. In accordance with Subparagraph 12.2.1.1 or 12.2.1.3.1, the Contractor shall provide a detailed breakdown of the costs as described herein and submit the costs and substantiating data in a proposal to the Owner:
- 12.2.2.1 Direct Costs: Direct costs shall be limited to the following: cost of materials, including sales tax and cost of delivery to the project; cost of labor (from apprentice level up through and including the general foreman classification) comprising of the base wage plus fringe benefits, including burden (Social Security, Worker's Compensation, and Unemployment Insurance, etc.); rental rate including fuel and maintenance for any power tools valued at over \$3,000 and equipment as described below, under "Equipment Rates;" bond premiums and additional cost of Builder's Risk Insurance, at rates equal to the amount billed for the base contract or the actual rate as supported by an invoice.
 - 12.2.2.1.1 Equipment Rates: For any machinery or special equipment (other than small tools) which has been authorized by the Project Manager, the Contractor shall receive the rental rates in the current edition and appropriate volume of the "Rental Rate Blue Book for Construction Equipment," published by K-III Directory Corp., 10 Lake Drive, Highstown, NJ 08520-5397.

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Hourly rental rates shall be determined as follows. The established hourly rental rate shall be equal to the adjusted monthly rate for the basic equipment plus the adjusted monthly rate for applicable attachments, both divided by 176, and multiplied by the area adjustment factor, plus the estimated hourly operating costs. The adjusted monthly rate is that resulting from application of the rate adjustment formula in order to eliminate replacement cost allowances in machine depreciation and contingency cost allowances. Attachments shall not be included unless required for the time and materials Work. For equipment not listed in the Blue Book, the Contractor shall receive a rental rate as agreed upon before such Work is begun. If agreement cannot be reached, the Owner reserves the right to establish a rate based on similar equipment in the Blue Book or prevailing commercial rates in the area. These rates shall apply for equipment used during the Contractor's regular shift of 10 hours per day. Where the equipment is used more than 10 hours per day, either on the Contractor's normal Work or on time and materials, and either on single or multiple shifts, an overtime rate, computed as follows, shall apply: The hourly overtime rate shall be equal to the adjusted monthly rate for the basic equipment plus the adjusted monthly rate for applicable attachments, both divided by 352, and multiplied by the area adjustment factor, plus the estimated hourly operating cost.

12.2.2.1.2 Equipment which must be rented or leased specifically for Work required under this section shall be authorized in writing by the Project Manager.

12.2.2.1.3 When it is necessary to obtain equipment from sources beyond the project limits exclusively for time and materials Work, the actual cost of transferring the equipment to the site of the Work and return will be allowed as an additional item of expense. Where the move is made by common carrier, the move-in allowance will be limited to the amount of the freight bill or invoice. If the Contractor hauls the equipment with his own forces, the allowance will be limited to the rental rate for the hauling unit plus operator wages. In the event that the equipment is transferred under its own power, the moving allowance will be limited to one-half of the normal hourly rental rate plus operator's wages. In the event that the move-out is to a different location, payment will in no instance exceed the amount of the move-in. Move-in allowance shall not be made for equipment brought to the project for time and materials Work which is subsequently retained on the project and utilized for completion of contract items, camp maintenance, or related Work.

12.2.2.1.4 Equipment ordered to be on stand-by basis shall be paid for at the stand-by rental rate for the number of hours in the Contractor's normal Work shift, but not to exceed 8 hours per day. The stand-by rental rate shall be computed as follows:

The hourly stand-by rate shall be equal to the adjusted monthly rate for the basic equipment plus the adjusted monthly rate for applicable attachments, both divided by 352, all multiplied by the

area adjustment factor.

Time will be recorded to the nearest one-half hour for purposes of computing compensation to the Contractor for equipment utilized under these rates.

The equipment Direct Cost determination covers all costs for providing required equipment and no additional compensation will be made for other costs such as, but not limited to, fuels, lubricants, replacement parts or maintenance costs. Cost of repairs, both major and minor as well as charges for mechanic's time utilized in servicing equipment to ready it for use prior to moving to the project and similar charges will not be allowed.

12.2.2.2 Overhead: Overhead shall include the following: the Contractor's management staff; supervision; superintendence; wages of timekeepers; watchmen and clerks; small tools; incidentals; costs of preparing and responding to Request for Proposals, including estimating; schedule revisions, software costs and clerical expenses; general home and field office expenses; including any financial/financing costs; legal costs; and/or accounting costs; temporary facilities; temporary utilities (power, water, sewer, telephone, etc.) And any utilities used by the Contractor during the construction period; and all other expenses not specifically defined in Subparagraph 12.2.2.1 as direct costs. Unless specifically required or requested, any travel and associated costs from outside of the Municipality of Anchorage is considered as part of the Contractor's project overhead and will not be paid by the Owner.

12.2.2.3 The Contractor shall apply a combined percentage rate to the direct costs to compensate it for additional Overhead and Profit associated with the change. The combined rate to the Owner of any change shall not exceed the rates set forth in the following schedule:

For the Contractor, for Work performed by his own forces, up to fifteen percent (15%) of direct costs;

For each Subcontractor involved, for Work performed by the Subcontractor's forces, up to fifteen percent (15%) of direct costs;

For the Contractor, for Work performed by Subcontractors, up to ten percent (10%) of the Subcontractor's direct costs;

For the Subcontractor, for Work performed by the multiple-tier-contractors up to ten percent (10%) of direct costs;

The total Contractor and all-subcontractors overhead allowance shall not exceed twenty-five percent (25%) of direct costs.

12.2.3 For Work proceeding on a time and material basis in accordance with Subparagraph 12.2.1.3.2, the Contractor shall be compensated for its costs in accordance with the following:

12.2.3.1 Direct Costs: Direct Costs shall be as defined in Subparagraph 12.2.2.1.

12.2.3.2 Overhead: Overhead shall be as defined in Subparagraph 12.2.2.2.

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- 12.2.3.3 Overhead and Profit combined included in the total costs to the Owner of any change shall not exceed the rates set forth in the following schedule:

For the Contractor, for Work performed by his own forces, up to ten percent (10%) of direct costs;

For each Subcontractor involved, for Work performed by the Subcontractor's forces, up to ten percent (10%) of direct costs;

For the Contractor, for Work performed by Subcontractors, up to five percent (5%) of the Subcontractor's direct cost.

For the Subcontractor, for Work performed by multiple-tier-contractors up to five percent (5%) of direct costs;

The total Contractor and multiple-tier-contractor overhead allowances shall not exceed twenty percent (20%) of direct costs.

- 12.2.4 If the net value of a change results in a credit from the Contractor, Subcontractor, or Material Suppliers or Vendors, the credit given shall be the net cost without overhead or profit. The costs as used herein shall include all items of labor, materials, plant and equipment. Credit changes shall include a percentage of the direct costs for overhead and profit at fifty percent (50%) of the rates defined in Subparagraph 12.2.2.3.
- 12.2.5 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if the quantities originally contemplated are so changed in the proposed Change Order that application of the agreed unit prices to the quantities of Work proposed will cause substantial inequity to the Owner or the Contractor, the applicable unit prices shall be equitably adjusted.
- 12.2.6 The Contract Sum, the Contract Time, and the date required for performance of any part of the Work may be changed only by a Change Order to the Contract. Each Change Order will be identified at the bottom of each approved RFP, with a heading of "Change Order Authorization." Change Orders executed pursuant to this article constitute full and final settlement of all aspects of cost and time related to and/or occasioned by the Work (or event) described therein. Costs are defined to include all direct labor costs; all direct materials and equipment expenses; any and all overhead, profit, and commission; any and all impact costs related to and/or occasioned by the Work described herein; as well as all taxes and insurance. All Change Orders shall be approved by the Project Manager and signed by the Owner and Contractor.
- 12.2.7 For accounting purposes, the Change Orders identified in Subparagraph 12.2.6 will be accumulated on a monthly basis or more frequently and summarized in a Summary Change Order. The Summary Change Order shall be approved by the Project Manager and signed by the Owner and Contractor. No claim by the Contractor for or on account of any Change Order shall be due nor shall any such claim appear on an Application for Payment or demand for final payment until the Summary Change Order has been fully executed by the Contractor and the Owner.
- 12.2.8 The Superintendent of Schools and/or the Senior Director of Capital Planning and Construction are authorized to make contract modifications or to execute orders up to one hundred thousand dollars (\$100,000) that are within the project's budget. The Superintendent is authorized to make contract modifications in excess of one hundred thousand dollars (\$100,000) but not-to-exceed two hundred fifty thousand dollars (\$250,000) that are within the project's budget. All contract modifications or change orders

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above two hundred fifty thousand dollars (\$250,000) shall be recommended by the Superintendent to the School Board for its approval.

12.2.9 No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment or more than six months after the date of substantial completion, whichever is earlier.

12.2.10 Nothing in this Article shall excuse the Contractor from proceeding with the Contract as changed.

12.3 DIFFERING CONDITIONS

12.3.1 The Contractor shall promptly, and before the conditions are disturbed, give written notice to the Owner of (1) subsurface or latent physical conditions at the site which differ materially from those indicated in this Contract, or (2) unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Contract.

12.3.2 The Owner shall investigate the site conditions promptly after receiving notice. Work shall not proceed at the affected site, except at the Contractor's risk, until the Owner has provided written instructions to the Contractor. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the Work under this Contract, whether or not changed as a result of the conditions, an adjustment shall be made under this Article and the Contract modified in writing accordingly.

12.3.3 No request by the Contractor for an adjustment to the Contract under this Article shall be allowed unless the Contractor has given the written notice required.

12.3.4 No claim by the Contractor for an adjustment hereunder shall be allowed if asserted after final payment or more than six months after the date of substantial completion, whichever is earlier.

12.4 CLAIMS FOR ADDITIONAL COST OR TIME

12.4.1 If the Contractor claims that additional cost is involved because of, but not limited to (1) any written interpretation pursuant to Subparagraph 2.2.8; (2) any order by the Owner to stop the Work pursuant to Paragraph 3.4 where the Contractor was not at fault; or (3) any other impacts related to the Work, the Contractor shall make such claim as provided in Subparagraph 12.4.2.

12.4.2 If the Contractor wishes to make a claim for an increase in the Contract Sum, and such claim is not barred under Paragraph 8.3, he shall deliver to the Project Manager written notice thereof within fourteen (14) days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property in which case the Contractor shall proceed in accordance with Paragraph 10.3. No such claim shall be valid unless so made. The written notice shall state:

12.4.2.1 the date, nature and circumstances of the conduct regarded as a change;

12.4.2.2 the name, function and activity of each Contractor official, agent or employee involved in or knowledgeable about such conduct;

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- 12.4.2.3 the identification of any documents and the substance of any communication involved in such conduct;
 - 12.4.2.4 in the instance of alleged acceleration of scheduled performance or delivery, the basis upon which it arose;
 - 12.4.2.5 the particular elements of Contract performance for which the Contractor may seek an equitable adjustment under this Paragraph, including:
 - 12.4.2.5.1 what Contract Drawings or Specification have been or may be affected by the alleged change;
 - 12.4.2.5.2 what labor or materials or both have been or may be added, deleted or wasted by the alleged change;
 - 12.4.2.5.3 to the extent practicable, what delay and disruption in the manner and sequence of performance and effect on continued performances have been or may be caused by the alleged change in accordance with Division 1, Section 01311, "Project Schedule;"
 - 12.4.2.5.4 what adjustments to the Contract Sum and other provisions of the Contract affected by the alleged change are estimated; and
 - 12.4.2.6 the Contractor's estimate of the time by which the Project Manager and Architect must respond to the Contractor's notice to minimize cost, delay or disruption of performance in accordance with Division 1, Section 01311, "Project Schedule."
- 12.4.3. After receipt of a Contractor's claim, the Project Manager may visit the site, schedule an informal review hearing, or request additional information in order to fully evaluate the issues of the claim. The Project Manager has thirty (30) calendar days to review the claim and to send a written decision to the Contractor. If the Project Manager agrees with the Contractor that the issues presented in the Contractor's claim justify a change in the Contract Sum or the Contract Time, the Project Manager and the Contractor shall negotiate the amount of the adjustment in the Contract.
- If the Project Manager determines that the claim does not justify a change in the Contract Sum or Contract Time, or if the Project Manager cannot reach agreement with the Contractor on the amount of the adjustment in the Contract Sum or Contract Time, the amount shall be determined in accordance with Paragraph 12.5
- 12.4.4 In no event shall the Contractor slow or stop the Work while such determination is pending and the Owner shall continue to make payment in accordance with the Contract Documents except as to the amount in dispute. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

12.5 RESOLUTION OF DISPUTED CLAIMS

- 12.5.1 All disputed claims arising from this contract shall be resolved according to the process identified in this section 12.5. This includes any interpretations of the contract documents, claims for increase in the Contract Sum or Contract Time, or any other issues of equitable adjustment.

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- 12.5.2 Disputes between the Owner and the Contractor will be processed through the appeal process described in 12.5.3 and/or through the use of Alternative Dispute Resolution (ADR) procedures described in 12.5.4.
- 12.5.3 Appeal Process
- 12.5.3.1 If the Contractor does not agree with the decision of the Project Manager, the Contractor may, within ten (10) calendar days of receipt of the decision, file a notice of appeal with the Chief Operating Officer. The Chief Operating Officer will then have sixty (60) calendar days to review the appeal and send a written decision to the Contractor.
- 12.5.3.2 If the Contractor does not agree with the final decision rendered by the Chief Operating Officer, it may pursue litigation.
- 12.5.4 ADR Process
- 12.5.4.1 Either the Owner or the Contractor may request, prior to litigation, that a dispute be submitted to mandatory mediation.
- 12.5.4.2 The parties shall jointly select and compensate a third party mediator.
- 12.5.4.3 Both parties shall attend joint mediation sessions and make a good faith effort to reach agreement through this process.
- 12.5.4.4 There is no obligation for either of the parties to accept any agreement during the mediation process.
- 12.5.5 The Contractor shall diligently carry on the Work and maintain the progress schedule during any dispute resolution proceedings, unless otherwise agreed in writing.

END OF ARTICLE 12

ARTICLE 13

UNCOVERING AND CORRECTION OF WORK

13.1 UNCOVERING OF WORK

13.1.1 If any portion of the Work should be covered contrary to the request of the Owner, Project Manager or the Architect or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Project Manager, be uncovered for his observation and shall be replaced at the Contractor's expense.

13.1.2 If any other portion of the Work has been covered which the Architect or the Project Manager has not specifically requested to observe prior to being covered, either may request to see such Work and it shall be uncovered by the Contractor. If such Work be found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such work be found not in accordance with the Contract Documents, the Contractor shall pay such costs unless it be found that this condition was caused by the Owner or a separate contractor as provided in Article 6, in which event the Owner shall be responsible for the payment of such costs.

13.2 CORRECTION OF WORK

13.2.1 The Contractor shall promptly correct all Work rejected by the Project Manager as defective or as failing to conform to the Contract Documents whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including additional Owner Administrative and legal expenses, and additional compensation for the Architect's and/or Project Manager's additional services made necessary thereby.

13.2.2 If, within one (1) year after the Date of Substantial Completion of the Work or designated portion thereof or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the Owner through the Project Manager to do so unless the Owner through the Project Manager has previously given the Contractor a written acceptance of such condition. This obligation shall survive the provisions of Subparagraph 9.5.5 and termination of the Contract. The Owner shall give such notice promptly after discovery of the condition.

13.2.3 The Contractor, unless removal is waived by the Owner, shall remove from the site all portions of the Work which are defective or non-conforming, or if permitted or required, he shall correct such Work in place by and at the expense of the Contractor promptly after receipt of notice, and such rejected Work shall not thereafter be tendered for acceptance unless the former rejection or requirement for correction is disclosed.

13.2.4 If the Contractor does not proceed with the correction of such defective or non-conforming Work within a reasonable time fixed by written notice from the Owner, through the Project Manager, the Owner may either:

13.2.4.1 by separate contract or otherwise replace or correct such Work and charge the Contractor the cost occasioned the Owner thereby and remove and store the materials or equipment at the expense of the Contractor, or

13.2.4.2 terminate this Contract for default as provided in Paragraph 14.1. If the Contractor does not pay the cost of such replacement or correction and the

removal and storage within ten (10) days thereafter, the Owner may upon ten (10) additional days' written notice sell such Work at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs that should have been borne by the Contractor, including compensation for the Owner's administrative and legal expenses, and additional services of the Architect and the Project Manager made necessary thereby. If such proceeds of sale do not cover all costs which the Contractor and an appropriate Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

13.2.5 The Contractor shall bear the cost of making good all Work of the Owner or separate contractors destroyed or damaged by such correction or removal.

13.2.6 Nothing contained in this Paragraph 13.2 shall be construed to establish a period of limitation with respect to any other obligation which the Contractor might have under the Contract Documents, including Paragraph 4.5. thereof. The establishment of the time period of one (1) year after the date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which his obligation to comply with the Contract documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to his obligations other than specifically to correct the Work.

13.3 ACCEPTANCE OF DEFECTIVE OR NONCONFORMING WORK

13.3.1 If the Owner prefers to accept defective or nonconforming Work, he may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect a reduction in the Contract Sum where appropriate and equitable, or the Owner may elect to accept payment in materials or services, in lieu of a reduction in the Contract Sum. If the amount of a reduction is determined after final payment, it shall be paid to the Owner directly by the Contractor.

END OF ARTICLE 13

ARTICLE 14

TERMINATION OF THE CONTRACT

14.1 TERMINATION BY THE OWNER

14.1.1 If the Contractor:

- 14.1.1.1 is adjudged bankrupt; or
- 14.1.1.2 makes a general assignment for the benefit of his creditors; or
- 14.1.1.3 has a receiver appointed on account of his insolvency; or
- 14.1.1.4 if he refuses or fails to commence the Work within the time required by this Contract; or
- 14.1.1.5 refuses or fails to prosecute the Work or any separable part with the diligence that will ensure its completion within the time specified in this Contract, including any extension; or
- 14.1.1.6 refuses or fails to provide sufficient and properly skilled workmen or proper materials or equipment to complete the Work in an acceptable manner and without delay; or
- 14.1.1.7 refuses or fails to complete the Work in accordance with the Project Schedule Milestone Dates set forth under Section 00200 hereof; or
- 14.1.1.8 fails to make prompt payment to Subcontractors or for materials or labor, or
- 14.1.1.9 persistently disregards laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction; or
- 14.1.1.10 fails or refuses to comply with the requirements of Division 1, Section 01311, "Project Schedule" of the Contract Documents; or
- 14.1.1.11 otherwise is guilty of a substantial violation of a provision of the Contract Documents,

then the Owner, may, without prejudice to any right or remedy and after giving the Contractor and his surety, if any, seven (7) days' written notice, terminate the employment of the Contractor and take possession of the site and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor and may finish the Work by whatever method he may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished. Such an event of termination shall at the option of the Owner result in the automatic assignment to the Owner of all of the Contractor's subcontracts, and the Owner may thereafter enforce such subcontracts in the prosecution of the Work in the same manner and to the same extent as the Contractor.

- 14.1.2 If the cost of finishing the Work exceeds the unpaid portion of the Contract Sum, the Contractor or his assigns, heirs or sureties shall pay the difference to the Owner. This obligation shall survive the termination of the Contract.

14.1.3 Nothing contained in this Article 14 shall impair any of the obligations of the surety.

14.2 TERMINATION FOR CONVENIENCE

14.2.1 The performance of the Work under this Contract may be terminated by the Owner in whole, or from time to time in part, whenever the Owner shall determine that such termination is in the best interest of the Owner. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which performance of Work under the Contract is terminated, and the date upon which such termination becomes effective.

14.2.2 After receipt of a Notice of Termination, and except as otherwise directed by the Owner, the Contractor shall:

14.2.2.1 stop Work under the Contract on the date and to the extent specified in the Notice of Termination;

14.2.2.2 place no further orders or subcontracts for materials, services or equipment, except as may be necessary for completion of such portion of this Work under the Contract as is not terminated;

14.2.2.3 terminate all orders and subcontractors to the extent that they relate to the performance of Work terminated by the Notice of Termination;

14.2.2.4 assign to the Owner, in the manner, at the times, and to the extent directed by the Owner, all of the right, title, and interest of the Contractor under the orders and subcontracts so terminated, in which case the Owner shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;

14.2.2.5 settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the Owner, to the extent he may require, which approval of ratification shall be final for all the purposes of this clause;

14.2.2.6 transfer title and deliver to the Owner, in the manner, at the times, and to the extent, if any, directed by the Owner, (A) the fabricated or unfabricated parts, Work in process, completed Work, supplies, and other material produced as a part of, or acquired in connection with the performance of, the Work terminated by the Notice of Termination, and (B) the completed or partially completed plans, drawings, information, and the property which, if the Contract has been completed, would have been required to be furnished to the Owner;

14.2.2.7 use his best efforts to sell, in the manner, at the time, to the extent and at the price or prices directed or authorized by the Owner, any property of the types referred to in Subparagraph 14.2.2.6 above, provided, however, that the Contractor (A) shall not be required to extend credit to any purchase, and (B) may acquire any such property under the conditions prescribed by and at a price or prices approved by the Owner, and provided further, that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Owner to the Contractor under this Contract or shall otherwise be credited to the price or cost of the Work covered by this Contract or paid in such other manner as the Owner may direct;

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- 14.2.2.8 complete performance of such part of the Work as shall not have been terminated by the Notice of Termination and may incur obligations as are necessary to do so; and
 - 14.2.2.9 take such action as may be necessary, or as the Owner may direct, for the protection and preservation of the property related to this Contract which is in the possession of the Contractor and in which the Owner has or may acquire an interest.
- 14.2.3 The Contractor may submit to the Owner a list, certified as to quantity and quality, of any or all items of termination inventory not previously disposed of, exclusive of items the disposition of which has been directed or authorized by the Owner, and may request the Owner to remove such items or enter into a storage agreement covering them. Not later than fifteen (15) days thereafter, the Owner will accept title to such items and remove them or enter into a storage agreement covering the same; provided that the list submitted shall be subject to verification by the Owner upon removal of all items, or if the items are stored within forty-five (45) days from the date of submission of the list, and any necessary adjustment to correct the list as submitted shall be made prior to final settlement.
- 14.2.4 After receipt of a Notice of Termination, the Contractor shall submit to the Owner his termination claim, in the form and with certification prescribed by the Owner. Such claim shall be submitted promptly but in no event later than six (6) months from the effective date of termination. Upon failure of the Contractor to submit his termination claim within the time allowed, the Owner may determine on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall thereupon pay to the Contractor the amount so determined.
- 14.2.5 Subject to the provisions of Subparagraph 14.2.4 above, the Contractor and the Owner may agree upon the whole or any part of the amount or amounts to be paid to the Contractor by reason of the total or partial termination of Work pursuant to this paragraph, which amount or amounts may include a reasonable allowance of profit on Work done; provided that such agreed amount or amounts, exclusive of settlement costs, shall not exceed the total Contract Sum as reduced by the amount of payments otherwise made and as further reduced by the Contract Sum attributable to that portion of Work not terminated. The Contract shall be amended accordingly, and the Contractor shall be paid the agreed amount. Nothing in Subparagraph 14.2.6 below, prescribing the amount to be paid to the Contractor in the event of failure of the Contractor and the Owner to agree upon the whole amount to be paid to the Contractor by reason of the termination of Work pursuant to this clause, shall be deemed to limit, restrict, or otherwise determine or affect the amount or amounts which may be agreed upon to be paid to the Contractor pursuant to this Subparagraph 14.2.5.
- 14.2.6 In the event of the failure of the Contractor and the Owner to agree, as provided in Subparagraph 14.2.5 above, upon the whole amount to be paid to the Contractor by reason of the termination of Work pursuant to this paragraph, the Owner shall pay to the Contractor the amounts determined by the Owner as follows, but without duplication of any amounts agreed upon in accordance with Subparagraph 14.2.5:
- 14.2.6.1 with respect to all Contract Work performed prior to the effective date of the Notice of Termination, the total (without duplication of any items) of:
 - 14.2.6.1.1 the cost of such Work;

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- 14.2.6.1.2 the cost of settling and paying claims arising out of the termination of Work under subcontracts or orders as provided in Subparagraph 14.2.2.5 above exclusive of the amounts paid or payable on account of supplies or materials delivered or services furnished by the Subcontractor prior to the effective date of the Notice of Termination Work under this Contract, which amounts shall be included in the cost on account of which payment is made under Subparagraph 14.2.6.1 above; and
- 14.2.6.1.3 a sum as profit on Subparagraph 14.2.6.1.1 above, determined by the Owner to be fair and reasonable; and
- 14.2.6.2 the reasonable cost incidental to termination of Work including:
 - 14.2.6.2.1 accounting, legal, clerical and other expenses reasonably necessary for the preparation of termination settlement proposals and supporting data;
 - 14.2.6.2.2 the termination and settlement of subcontracts (excluding the amounts of such settlements); and storage, transportation and other costs incurred (pursuant to Subparagraph 14.2.2.9), reasonably necessary for the preservation, protection or disposition of the termination inventory.
- 14.2.6.3 The total sum to be paid to the Contractor under Subparagraph 14.2.6.1 above shall not exceed the total Contract Sum as reduced by the portion of the Contract Sum attributable to that portion of Work not terminated. Except for normal spoilage, and except to the extent that the Owner shall have otherwise expressly assumed the risk of loss, there shall be excluded from the amounts payable to the Contractor under Subparagraph 14.2.6.1, the fair value, as determined by the Owner, of property which is destroyed or lost, stolen, or damaged so as to become undeliverable to the Owner, or to a buyer pursuant to Subparagraph 14.2.2.7.
- 14.2.7 In arriving at the amount due the Contractor under this paragraph, there shall be deducted (1) all unliquidated advance or other payments on account theretofore made to the Contractor, applicable to the terminated portion of this Contract, (2) any claim which the Owner may have against the Contractor in connection with this Contract, and (3) the agreed price for, or the proceeds of sale of, any materials, supplies or other things acquired by the Contractor or sold, pursuant to the provisions of this paragraph and not otherwise recovered by or credited to the Owner.
- 14.2.8 If the termination hereunder be partial, the Contractor may file with the Owner a claim for an equitable adjustment of the price or prices specified in the Contract relating to the continued portion of the Contract (the portion not terminated by the Notice of Termination), and such equitable adjustment as may be agreed upon shall be made in such price or prices. Any claim by the Contractor for an equitable adjustment under this clause must be asserted within ninety (90) days from the effective date of the termination.
- 14.2.9 The Owner may from time to time, under such terms and conditions as it may prescribe, make partial payments and payments on account against costs incurred by the Contractor in connection with the terminated portion of this Contract whenever in the opinion of the Owner the aggregate of such payments shall be within the amount to which the Contractor will be entitled hereunder. If the total of such payments is in excess of the amount finally agreed or determined to be due under this paragraph, such excess shall be payable by the

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Contractor to the Owner upon demand, together with interest computed at the legal prevailing rate, for the period from the date such excess payment is received by the Contractor to the date on which such excess is repaid to the Owner, provided, however, that no interest shall be charged with respect to any such excess payment, attributable to a reduction in the Contractor's claim by reason of retention or other disposition of termination inventory until ten (10) days after the date of such retention or disposition, or such later date as determined by the Owner by reason of the circumstances.

- 14.2.10 Unless otherwise provided for in this Contract, or by applicable statute, the Contractor shall - from the effective date of termination until the expiration of three (3) years after final settlement under this Contract - preserve and make available to the Owner at all reasonable times at the office of the Contractor but without direct charge to the Owner, all his books, records, documents and other evidence bearing on the costs and expenses of the Contractor under this Contract and relating to the Work terminated hereunder, or, to the extent approved by the Project Manager, photographs, microphotographs, or other authentic reproductions thereof.

END OF ARTICLE 14

END OF SECTION

SUPPLEMENTARY GENERAL CONDITIONS TO THE CONTRACT FOR CONSTRUCTION

REFERENCE:

1. **GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ANCHORAGE SCHOOL DISTRICT, ANCHORAGE, ALASKA**, constitutes the General Conditions of this Contract, and is further revised and supplemented by the provisions of these Supplementary General Conditions. The General Conditions and the Supplementary General Conditions are applicable to all of the work under this Contract and shall apply to the Contractor and all Subcontractors, Sub-subcontractors, and Material Suppliers and Vendors.

SUPPLEMENTS:

1. The following supplements modify, change, delete, or add to the General Conditions. Where any article of the General Conditions is modified or any paragraph deleted, subparagraph or clause thereof is modified, or deleted by these supplements, the unaltered provisions of such article, paragraph, sub-paragraph or clause shall remain in effect.

ARTICLE 4

Add the following new Paragraph 4.21, Construction Management Software:

4.21 CONSTRUCTION MANAGEMENT SOFTWARE

- 4.21.1 The Contractor shall fully utilize the Owner provided construction management software, currently Sage Procore Construction Management for communications, Submittals, Requests for Information, for submission of construction record documents and photographs, and other purposes as directed by the Project Manager.
- 4.21.2 The contractor shall designate a minimum of two (2) people from their internal project staff to access the Construction Management Software. It is incumbent upon the Contractor to ensure these individuals familiarize themselves and become proficient in the use of the Construction Management software utilizing the manuals, help files, training videos, forums and other support services provided by the Construction Management Software.

ARTICLE 7

Add the following new Paragraph 7.12, Fire Alarm System:

7.12 FIRE ALARM SYSTEM

- 7.12.1 Before beginning any work that may result in a fire alarm transmission, the contractor shall call both the Anchorage Fire Department dispatcher at 522-1122 and the local fire station which would respond to an alarm and let them know you will be working on the system and for approximately how long. Second the contractor shall call Guardian Security at 277-1975 and notify the dispatcher that you have called the Fire Department, what type of work you are planning to do, and approximately how long before you expect to be completed. After the contractor is completed with your work, you must reverse the process by notifying the Fire Department dispatcher and the ASD Dispatcher that you are finished.

- 7.12.2 The Contractor shall be held responsible for all charges incurred from false fire alarms. Currently the Anchorage Fire Department charges seven hundred fifty dollars and no cents (\$750.00) per false alarm, or current rate charged.

Add the following new Paragraph 7.13, Apprenticeship Utilization Requirements for Contracts:

7.13 APPRENTICESHIP UTILIZATION REQUIREMENTS FOR CONTRACTS

- 7.13.1 Once awarded a contract by ASD, the prime contractor will be responsible to gather and submit all documentation to ASD to confirm compliance with the Apprenticeship Utilization Policy ("AUP") mandated by Anchorage School Board Policy 3311.1.2. The Prime contractor will provide documentation to ASD to confirm that 15% of the labor hours worked in trades/crafts categories that are included in the Alaskan Federally Registered Apprenticeship Program has been executed by certified apprentices enrolled in those programs, and will provide documentation to confirm that the apprentices listed on the documentation submitted are currently in good standing with their Alaskan Federally Registered Apprenticeship Program. ASD will provide several forms which the prime contractor will be required to fill out in addition to submitting their certified payroll documents. Also, ASD will audit the prime contractor's documentation on the following schedule. Audits for smaller projects will be conducted every 30 days, audits for larger projects the will be done every 90 days. In addition, ASD will conduct on-site audit at non-scheduled intervals to ensure that the apprentices listed on the written documentation are physically on-site. ASD will give a reasonable notice of 24 hours prior to on-site inspections.
- 7.13.2 The prime contractor will be required to submit the following, at the intervals requested by ASD:
- Certified Payroll for prime and subcontractors.
 - Apprenticeship Utilization Form for prime and subcontractors.
 - Apprenticeship Utilization Calculation form for prime and subcontractors, which demonstrates labor hours worked by apprentices in applicable crafts/trades categories, and reports status as to whether the apprentices listed are in good standing with their Alaskan Federally Registered Apprenticeship Program.

Add the following new Paragraph 7.14, Preference for Alaska Forest Products:

7.14 PREFERENCE FOR ALASKA FOREST PRODUCTS

- 7.14.1 **Preference for Alaska Forest and Agricultural Products**
This project is funded by state money in which the use of timber, lumber, and manufactured lumber products are required, and, therefore, only timber, lumber, and manufactured lumber products originating in this state from local forest products shall be used whenever practical.

Pursuant to AS 36.15.050 and AS 36.30.322, agricultural and timber, lumber and manufactured lumber products harvested in Alaska shall be used in state funded projects whenever they are priced no more than seven percent above agricultural/wood products harvested outside the state and are of a like quality as compared with agricultural/wood

products harvested outside the state. The Contractor shall maintain records which establish the type and extent of Alaska agricultural/wood products utilized. When such products are not utilized, the Contractor shall document the efforts the Contractor made towards obtaining agricultural/wood products harvested in Alaska and include in this documentation a written statement that the Contractor contacted the manufacturers and suppliers identified on the Department of Commerce and Economic Development's list of suppliers of Alaska forest products concerning the availability of agricultural/wood products harvested in Alaska and, if available, the product prices. The Contractor shall complete this documentation at a time determined by the district's project manager.

The Department of Commerce and Economic Development's list of suppliers of Alaska forest products is available at:

<http://www.commerce.state.ak.us/ded/dev/prodpref/fppproduct.cfm>

The Contractor's use of agricultural/wood products that fail to meet the requirements of this section shall be removed and replaced in accordance with **Division 0, Section 00700, paragraph 13.3** of the contract. In addition, pursuant to AS 36.15.050(d), the district may withhold payment until the Contractor complies with this section.

To clarify, the actions required by the successful bidder awarded the contract are as follows:

- For all lumber items required under the contract the Contractor will contact all applicable suppliers of Alaska forest products to determine availability and cost.
- Contractor must use lumber from the suppliers of Alaska forest products unless the cost of the Alaska forest products that are of like quality is seven percent higher than non-Alaska produced forest products, or the Alaska forest products are not available.
- Contractor must maintain records showing efforts made in using Alaska forest products or evidence of Alaska forest products not being available or reasonably competitive.
- The records showing compliance with the Alaska forest products preference must be provided to Owner during the submittal process (Division 1, Section 01300).
- Per AS 36.15.010 if the Contractor fails to provide evidence regarding proper sourcing and comparison of Alaska forest products, the District shall withhold payment until the Contractor complies.

ARTICLE 9

Add the following new Paragraph 9.12, Liquidated Damages:

9.12 LIQUIDATED DAMAGES

- 9.12.1 Should the Contractor fail to substantially complete the Work on or before any date stipulated for Substantial Completion (or such later date as may result from extension of time granted by the Owner), he shall pay the Owner, as liquidated damages, the sum of one thousand dollars and no cents (\$1,000.00) for each consecutive calendar day that terms of the contract remain unfulfilled beyond the date allowed by the Contract, which sum is agreed upon as a reasonable and proper measure of damages which the Owner will sustain per day by failure of the Contractor to complete work within time as stipulated; it being recognized by the Owner and to the Contractor that the injury to the Owner which could result from a failure of the Contractor to complete on schedule is uncertain and

cannot be computed exactly. In no way shall costs for liquidated damages be construed as a penalty on the Contractor.

- 9.12.2 For each consecutive calendar day that the Work remains incomplete after the date established for Final Completion, the Owner will retain from the compensation otherwise to be paid to the Contractor the sum of one thousand dollars and no cents (\$1,000.00). This amount is the minimum measure of damages the Owner will sustain by failure of the Contractor to complete all remedial work, correct deficient work, clean up the project and miscellaneous tasks as required to complete all work specified.
- 9.12.3 In no instance shall more than one thousand dollars and no cents (\$1,000.00) a day are assessed for liquidated damages for work, which remains incomplete.

ARTICLE 10

Add the following new Paragraph 10.4, Compliance:

10.4 COMPLIANCE

- 10.4.1 When the school is in session the Contractor will be restricted to the areas, which do not interfere with school operations. These areas shall be safety and security fenced to not impact school operations. Additional areas may be utilized upon concurrence of the Project Manager. The Contractor shall minimize his impact on education while his work is in progress. Workers must stay out of school while school is in session. All renovation work in the existing school, including sprinklers, must be performed while school is not in session. If scheduling pushes this work into the school session, then the work must be performed on nights and weekends.
- 10.4.2 The Contractor must maintain interior building fire exits through the construction areas and maintain these exits during all school operation hours. These exit routes may not be modified without concurrence of the Project Manager and the School Principal.

ARTICLE 11

Remove and replace Section 11.3.3.1 with the following:

- 11.3.3.1 The Contractor shall maintain an umbrella liability policy according to the following:
- Projects < \$2 million construction cost - \$1,000,000 per occurrence and annual aggregate.
- Projects < \$10 million construction cost – \$5,000,000 per occurrence and annual aggregate.
- Projects > \$10 million construction cost – \$10,000,000 per occurrence and annual aggregate.
- This requirement does not apply to Subcontractors.

ARTICLE 12

Article 12, 12.5.2: Delete this section in its entirety and replace with the following:

- 12.5.2 Disputes between the Owner and the Contractor will be processed through the appeal process described in 12.5.3.

Article 12, 12.5.3: Delete this section in its entirety and replace with the following:

12.5.3 Appeal Process

- 12.5.3.1 The contractor will submit in writing the issue(s) being claimed and the Project Manager will review. The Project Manager may visit the site, schedule a review hearing, or request additional information in order to fully evaluate the issues of the claim. The Project Manager will send the written decision to the Contractor within ten (10) days of receipt of claim.
- 12.5.3.2 If the Contractor does not agree with the decision of the Project Manager, within ten (10) days from the receipt of the written decision by the Project Manager, the Contractor may request an appeal of the decision to the Senior Director of Capital Planning & Construction. The Senior Director of Capital Planning & Construction will then have ten (10) days to review the issue(s) and send a written decision to the Contractor.
- 12.5.3.3 If the Contractor does not agree with the decision of the Senior Director of Capital Planning & Construction, within ten (10) days from the receipt of the written decision by the Senior Director of Capital Planning & Construction, the Contractor may request an appeal of the decision to the Chief Operating Officer. The Chief Operating Officer will then have ten (10) days to review the issue(s) and send a written decision to the Contractor.
- 12.5.3.4 If the Contractor does not agree with the final decision rendered by the Chief Operating Officer, it may pursue litigation.
- 12.5.3.5 The Contractor may bring no action on claims unless the claims have been properly raised in accordance with all notice provisions of the conditions and considered in the above dispute-resolution procedures.
- 12.5.3.6 The Contractor shall diligently carry on the Work and maintain the progress schedule during any dispute-resolution proceedings, unless otherwise agreed in writing.
- 12.5.3.7 Any step in the process identified above can be waived only by explicit written waiver by both parties.

Article 12, 12.5.4: Delete this section in its entirety.

END OF SECTION

WAGE RATES

I. GENERAL

A. STATE OF ALASKA PREVAILING WAGE SCALE AND ALASKA HIRE

Attention of bidders is particularly called to the requirements as to conditions of employment to be observed and minimum wage rates to be paid under the Contract. Among other things, the requirements of Alaska's Little Davis Bacon Act (AS 36.05.010) are applicable to this project. Each bidder must inform himself/herself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his/her obligation to furnish all material and labor necessary to carry out the provisions of the Contract.

State Labor Wage and Hour Administration Pamphlets No. 600 for Laborers' and Mechanics' are updated on April 1, and September 1. It is the responsibility of the bidder to obtain the new labor wage and hour rates when available from the State of Alaska Department of Labor, and to use the Prevailing wage scale and hiring requirements when formulating your bid.

For copies of this pamphlet, contact the nearest office of the Division of Labor Standards and Safety, Wage and Hour office or visit the internet site at:

<http://labor.state.ak.us/lss/pamp600.htm>

END OF SECTION

SUMMARY OF WORK

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of this Contract comprises the general construction of the facility identified in the Solicitation including all noted site improvements.
- B. Definition of Site: Wherein the term Site is used in the contract documents, it shall mean the areas where work is to be performed; located as identified in the Solicitation and on the Contract Drawings.
- C. Acceptance of Site: The Contractor shall fully inform himself of the areas in which work is to be processed, material delivered, and limitation in working conditions, and access to work areas.
- D. Existing Conditions: The drawings may not show all arrangements and condition of the site as they now exist. The Contractor shall be responsible for a complete visual inspection.

1.03 CONTRACT

- A. Construct the work under a single fixed price contract as bound herein.
- B. It is the intent of these documents to require all work for a complete facility and plant with only minor owner-furnished items to be incorporated. See technical sections for specifics.

1.04 WORK FURNISHED AND INSTALLED BY OWNER

- A. Equipment and furniture as noted in documents. Other Contractors or ASD Maintenance personnel may be performing work at this facility concurrent with this project. See Section 1.07 below for requirements concerning coordination with Contractor's work.

1.05 GENERAL PROJECT DESCRIPTION

- A. General Description: Provide all labor, materials, equipment, testing, tools and supervision as required to complete the roof replacement as indicated in the project documents. Spring Hill Elementary School is located at 9911 Lake Otis Parkway, Anchorage Alaska 99507.
- B. Construction: Provide all labor, materials, equipment, testing, tools, supervision and other as required to properly complete the roof replacement at Spring Hill Elementary School as indicated in the project documents. Entirety of work, including additive alternates, if applicable, includes, but is not limited to:
 - 1. Hazardous materials removal and ability to work around these materials as some materials are existing to remain.
 - 2. Removal of existing approximately 53,000 square feet of low-sloped metal roofing.

3. Removal of approximately 4,000 square feet of existing epdm roof and associated framing.
 4. Installation of new roof insulated metal panels for all roof sections.
 5. Installation of fall protection including, but not limited to, controlled access zones, fall restraint and extension ladder connection point(s).
 6. Demolition and removal of existing smoke hatches in roof over stage.
 7. Structural work as required and detailed in the project documents.
 8. Mechanical to include, but not limited to work on and around vents, diffusers, rain leaders, roof drains, boiler flue, and curbs.
 9. Electrical work, including but not limited to power, telecommunications, heat trace and cameras.
- C. Sequence the start, conduct and completion of Work as required in Section 00200, Project Schedule Milestone Dates.

1.06 CONTRACTOR'S USE OF PREMISES

- A. Limit use of premises for work and for storage to allow for:
1. Area of site indicated on Contract Drawings
 2. Owner occupancy of existing building
 3. Public use
 4. Coordinated use of premises under direction of Project Manager.
 5. Full responsibility for protection and safekeeping of products under this Contract stored at Site.
 6. Moving any stored products, under Contractor's control, which interfere with operations of Owner or separate Contractor.

1.07 OWNER'S USE OF PREMISES

- A. During the regular school year, conduct operations to minimize interference with normal school operations.
- B. Schedule any work which could interfere with school operations during summer vacation or when the school is not in session during the regular year.
- C. Cooperate with Project Manager in conducting operations to minimize conflict with and to facilitate Owner usage as established by the Project Manager.
- D. Schedule work to maintain Owner's continuous operation. Include in contract sum sufficient funds as may be required for any "after-hours" work caused by this requirement. No additional payment to Contractor will be authorized because of Contractor's failure to anticipate required "after-hours" work.
- E. At all times conduct operation as to insure the least inconvenience to students, staff, visitors, and the general public.
- F. The contractor shall provide advance notice at least 72 hours prior to any utility outages or other operations anticipated to inconvenience the school activities. The Project Manager

will review and evaluate the request. The contractor may have to reschedule the operations to another time that will not impact school activities.

- G. The Contractor shall be responsible for maintaining power to the Fire Alarm, Security and Network systems to ensure they are in proper working order throughout the project. If the systems must be off-line during the project, the Contractor shall obtain written approval from the Project Manager. During any time in which the fire alarm or security system is not operational, the Contractor shall provide a fire watch and security watch 24 hours a day, 7 days a week, for the entire period of the shutdown at no additional cost to ASD. The Contractor shall notify the ASD Project Manager of the intended method 72 hours prior to the shutdown.
 - 1. An acceptable method of maintaining power to the fire alarm and security panels includes maintaining power during the entire period of the Electrical Utility Shutdown.
- H. While school is occupied by students and the general public the contractor must keep operational the emergency egress lighting.

1.08 COORDINATION OF NOISE, DUST AND FUMES

- A. Contain noise, dust and fumes within work area. Notify Project Manager at least 24 hours prior to any necessary excessive noise, dust or fumes. Comply with the Project Manager's instructions.

1.09 PRODUCTS FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR

- A. Owner's Responsibilities:
 - 1. Arrange for and deliver necessary shop drawings, product data, and samples to Contractor.
 - 2. Arrange and pay for product delivery to Site in accordance with construction schedule.
 - 3. Deliver supplier's bill of materials to Contractor.
 - 4. Inspect deliveries jointly with Contractor
 - 5. Submit claims for Transportation damage.
 - 6. Arrange for replacement of damaged, defective, missing or otherwise unacceptable items.
 - 7. Arrange for manufacturer's warranties, bonds, service, and inspections as required.
- B. Contractor's Responsibilities:
 - 1. Designate delivery date for each product in construction schedule.
 - 2. Receive and unload products at Site.
 - 3. Promptly inspect products jointly with Owner, record shortages, damaged or defective items.
 - 4. Handle products at Site, including uncrating and storage.
 - 5. Protect products against damage and discoloration.
 - 6. Assemble, install, connect, adjust, and finish products, as stipulated in respective Specification Sections.
 - 7. Clean, repair, or replace items damaged by Contractor.

1.10 SALVAGE RIGHTS

- A. Except where noted otherwise on contract documents, existing equipment which is removed as a part of the work shall become the property of the Contractor to dispose of as he sees fit.

- B. Remove scheduled materials and equipment without damaging items. Store items in protected environment. Coordinate with Owner for pick up and/or delivery to the owner. If delivered to the owner include project name and school for easy identification.

1.11 USE OF OWNER'S PROPERTY AND EQUIPMENT

- A. Use of Owner's property or equipment such as tools, ladders, furniture, janitorial equipment and supplies, etc., is strictly prohibited.

1.12 PERMITTING

- A. Reference Section 00700, paragraph 4.7.1.1 for payment of permit.
- B. Contractor shall obtain all necessary building permits required to complete the scope of work identified in the contract documents. These include any/all subcontractor or specialty permits.
- C. Contractor shall ensure all required Municipal inspections, in accordance with the aforementioned permits, are requested and conducted prior to covering, closing or concealing the work in the field. Understanding and adhering to all MOA inspection requirements is mandatory. The Owner is not liable for re-inspection or rework costs associated with non-conforming or prematurely concealed work.
- D. Contractor shall maintain an inspection log and retain copies of all inspection reports, on site, for review by inspection officials and district project representatives.

END OF SECTION

BID ALTERNATES

PART 1. GENERAL

1.01 DESCRIPTION

A. Work included:

To allow the Owner to compare total costs where alternate materials and methods might be used, certain alternatives have been established as described in this Section of these Specifications.

B. Related work described elsewhere:

1. Pertinent Sections of these Specifications describe materials and methods required under the various alternatives.
2. The method for stating the proposed contract amount is described on the Bid Form.

1.02 SUBMITTALS

- A. All alternatives described in this Section of these Specifications are required to be reflected in the space provided on the Bid Form for this work. However, do not submit alternatives other than those described in this Section. Amounts submitted for alternatives shall include all overhead, profit, bonds, insurance and similar related costs.

1.03 BASE BID

- A. Includes all Work shown on Drawings or included in Specifications, excepting only that Work specifically noted in the following Alternate Bids, and that Work specifically noted as excepted.

PART 2. PRODUCT

2.01 DESCRIPTION

- A. This Project consists of the Basic Bid and noted Alternates. The Contract Documents have been prepared to show both basic and alternate work. In case the alternate work is not included in the contract work it will be the Contractor's responsibility to construct basic work by excluding alternate work as described below. Revised drawings excluding alternate work will not be issued.
- B. Work required by the following alternates shall include the finishing of all labor and materials to provide a complete and usable finished installation.
- C. The extent of alternates is described on the Drawings or specified herein.
- D. The Technical Specifications shall apply to all alternates unless modified herein.

2.02 LIST OF ALTERNATES

- A. Alternate Number One: Provide and install new cameras and all work associated with them instead of reinstallation of existing.

PART 3. EXECUTION

3.01 ADVANCE COORDINATION

- A. Immediately after award of the contract, or as soon thereafter as the Owner has made decision on which if any alternatives will be selected, thoroughly and clearly advise all necessary personnel and suppliers as to the nature and extent of alternatives selected by the Owner. Use all means necessary to alert those personnel and suppliers involved as to all changes in the work caused by the Owner's selection or rejection of alternatives.

END OF SECTION

PROJECT COORDINATION

PART 1. GENERAL

1.01 GENERAL CONTRACTOR

- A. Coordinate work of his own employees and subcontractors and coordinate his work with that of other contractors and Owner.
- B. Expedite his work to assure compliance with schedules.
- C. Comply with orders and instructions of the Project Manager.
- D. Monitor and control the use of site:
 - 1. Supervise field engineering and site layout.
 - 2. Allocate space for each subcontractor's use for field offices, sheds, work and storage areas.
 - 3. Establish access, traffic, parking allocations, and regulations.

1.02 GENERAL AND SUBCONTRACTORS SHALL DILIGENTLY COMPLY WITH THE FOLLOWING:

- A. Cooperate in planning and layout of the work well in advance of operations. Inform other contractors of requirements at proper time to prevent delay or revisions.
- B. Be informed of the requirements of other contractors and check own work for conflicts with the work of others.
- C. Ensure delivery of materials and performance of work on coordinated schedule with other contractors.
- D. Be responsible for proper layout of the work, and for all lines and measurements for all of the work executed under the contract documents. Verify the figures shown on the drawings before laying out the work and report any inaccuracies in writing to the Project Manager before commencing work. The Owner, Architect or their representative will in no case assume the responsibility for layout of the work.
- E. The mechanical and electrical trades shall be responsible for the layout of the ductwork, piping and conduits based on the reference lines established.

1.03 COORDINATING UTILITIES

- A. Cooperate and coordinate work with all utilities to be installed for service to Project. Utilities may include, but are not limited to water, sewer, natural gas, telephone, electrical, and cable television. Contractor shall maintain communication with utilities in order to coordinate time and requirements of utilities' installation.
- B. Contractor shall provide all work necessary to comply with requirements of Contract Documents for Utility work that does not meet Contract Document requirements, or for work that is disturbed by utility installation.

1.04 OWNER NOTIFICATION/REIMBURSEMENT

- A. Provide the Owner forty-eight (48) hours advance notice of his intention to work overtime,

nights, Sundays or holidays, or anytime outside the usual working hours. In no case will the Contractor do any such work without first notifying the Owner to permit arrangements for proper inspection. Unless of an emergency nature, work performed in violation of this paragraph will not be paid for.

- B. Reimburse the additional cost to the Owner for inspection work on Sundays or recognized holidays. Such reimbursement shall include all additional costs to the Owner.
- C. Reimbursement for inspection or observation required of the Project Manager or the Engineer on Sundays or recognized holidays shall be at the rate of One Hundred Fifty dollars (\$150.00) per man-hour of work.
- D. The contractor shall reimburse the additional cost to the owner, architect and consultants for inspection work beyond a first substantial of first final completion inspections. The contractor is expected to be virtually complete at time of substantial completion inspection with only minor punchlist items remaining. Should punchlist items remain at time of final inspection and should subsequent inspections be required, the contractor shall pay all costs for all.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

CUTTING AND PATCHING

PART 1. PART GENERAL

1.01 DESCRIPTION OF WORK

- A. Cutting and patching is defined to include, but it not necessarily limited to, the cutting and patching of nominally completed work, and is defined to exclude integral cutting and patching during the manufacturing, fabricating, erecting, and installing process for individual units of work.
- B. Contractor shall be responsible for all cutting, fitting, and patching required to complete the work or to:
 - 1. Accommodate the coordination of work.
 - 2. Provide for installation of other work.
 - 3. Remove and replace defective work.
 - 4. Remove and replace work not conforming to requirements of Contract Documents.
 - 5. Uncover other work for access or inspection.
 - 6. Obtain samples for testing or similar purposes.
 - 7. Provide routine penetrations of nonstructural surfaces for installation of piping and electrical conduit.

1.02 RELATED REQUIREMENTS

- A. Section 00700 Article 4.14.
- B. Section 01010 - Summary of Work.
- C. Individual Specification Sections:
 - 1. Cutting and patching incidental to work of the Section.
 - 2. Advance notification to other Sections of openings required in work of those Sections.
 - 3. Limitations on cutting structural members.

1.03 SUBMITTALS

- A. Ten (10) days prior to beginning any demolition activities, the Contractor shall provide written notification to EPA, in accordance with NESHAP regulations, with copy to Project Manager. Notice shall indicate asbestos containing materials are or are not anticipated to be encountered. If no asbestos is anticipated, a negative declaration is made addressing 40CFR61.146 (a), (b) and (c,1-5).
- B. Submit written request in advance of cutting or alteration which affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather-exposed or moisture-resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight-exposed elements.
 - 5. Work of Owner or separate contractor.
- C. Include in Request:
 - 1. Identification of Project.
 - 2. Location and description of affected work.
 - 3. Necessity for cutting and alteration.

4. Description of proposed work. Designate:
 - a. Scope of cutting and patching.
 - b. Contractor and trades to execute work.
 - c. Products proposed to be used.
 - d. Extent of refinishing.
5. Date and time work will be executed.

PART 2. PRODUCTS

2.01 MATERIALS

- A. For replacement of work removed, comply with specifications for type of work to be done, unless otherwise noted.
- B. Provide materials for cutting and patching which will result in equal to or better than the work being cut and patched in terms of performance characteristics and visual effect where applicable.

PART 3. EXECUTION

3.01 GENERAL

- A. Execute cutting, fitting, and patching to complete Work, and to:
 1. Fit the several parts together, to integrate with other Work.
 2. Uncover work to install or correct ill-timed Work.
 3. Remove and replace defective and non-conforming Work.
 4. Remove samples of installed Work for testing.
 5. Provide openings in elements of Work for penetrations of mechanical and electrical work.
 6. Repair surfaces damaged by removal or relocation of surface mounted or built-in items.

3.02 INSPECTION

- A. Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- B. Do not cut and patch work which is exposed to view in a manner resulting in a reduction of visual qualities or resulting in substantial evidence of the cut and patch work. Remove and replace work judged by Project Manager to be visually unsatisfactory.
- C. After uncovering, inspect conditions affecting performance of work.
- D. Beginning of cutting or patching means acceptance of existing conditions.

3.03 PREPARATION

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by cutting and patching operations, as directed. Return adjacent areas to condition existing prior to start of work.
- B. Provide supports to assure structural integrity of surroundings; devices and methods to

protect other portions of Project from damage.

- C. Provide protection from elements for areas which may be exposed by uncovering work; maintain openings free of water.

3.04 PERFORMANCE

- A. Execute work by methods to avoid damage to other work, and which will provide proper surfaces to receive patching and finishing.
- B. Restore work with new products in accordance with requirements of Contract Documents.
- C. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. Maintain all fire assembly rating wall or area separation construction in accordance with applicable codes.
- D. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

END OF SECTION

MECHANICAL AND ELECTRICAL COORDINATOR

PART 1. GENERAL

1.01 DESCRIPTION

- A. Mechanical and electrical coordinator.
- B. Submittals.
- C. Coordination required.
- D. Coordination documents.
- E. Coordination of submittals.
- F. Coordination of substitutions and modifications.
- G. Observation of Work.
- H. Documentation.
- I. Inspection and acceptance of equipment.
- J. Equipment start-up.

1.02 RELATED SECTIONS

- A. Section 01010 - Summary of Work.
- B. Section 01300 - Submittals: Shop drawings, product data, and samples.
- C. Section 01650 - Starting of Systems: Starting of systems. Testing, Adjusting, and Balancing of Systems. Systems Demonstration.
- D. Section 01700 - Project Closeout: Project closeout procedures, project record documents, operation and maintenance data, warranties, and spare parts and maintenance materials.

1.03 MECHANICAL AND ELECTRICAL WORK COORDINATOR

- A. The Contractor shall employ a person, technically qualified and administratively experienced in field coordination for the mechanical and electrical work required for this Project, for the duration of the Work.

1.04 SUBMITTALS FOR REVIEW

- A. Submit coordination drawings and schedules prior to submitting shop drawings, product data, and samples.

1.05 COORDINATION REQUIRED

- A. Coordinate work of Divisions 23, and 26 and with work of other divisions.

- B. Coordinate progress schedules, including dates for submittals and for delivery of Products.
- C. Participate in progress meetings. Report on progress of Work to be adjusted under coordination requirements, and any required changes in schedules. Transmit minutes of meetings and Reports to concerned parties.

1.06 COORDINATION DOCUMENTS

- A. Prepare coordination drawings to organize installation of Products for efficient use of available space, for proper sequence of installation, and to identify potential conflicts.
- B. Identify electrical power characteristics and control wiring required for each item of equipment.
- C. Maintain documents for the duration of the Work, recording changes due to site instructions, modifications or adjustments.
- D. After the Anchorage School District's review of original and revised documents, reproduce and distribute copies to concerned parties.

1.07 COORDINATION OF SUBMITTALS

- A. Review Shop Drawings, Product Data, and Samples for compliance with Contract Documents and for coordination with work of the Project Manual. Transmit for review, copy reviewed documents to the Anchorage School District.
- B. Check field dimensions and clearances and relationship to available space and anchors.
- C. Check compatibility with equipment and Work of other sections, electrical characteristics, and operational control requirements.
- D. Check motor voltages and control characteristics.
- E. Coordinate controls, interlocks, wiring of pneumatic switches, and relays.
- F. Coordinate wiring and control diagrams.
- G. Review the effect of any changes on work of other sections.
- H. Verify information and coordinate maintenance of record documents.

1.08 COORDINATION OF SUBSTITUTIONS AND MODIFICATIONS

- A. Review proposals and requests from Subcontractors.
- B. Verify compliance with Contract Documents and for compatibility with Work and Products of other sections. Submit with recommendation for action.

1.09 OBSERVATIONS OF WORK

- A. Observe Work for compliance with Contract Documents.
- B. Maintain a list of observed deficiencies and defects; promptly submit a written report bi-weekly.

1.10 DOCUMENTATION

- A. Observe and maintain a record of tests. Record:
 - 1. Specification section number.
 - 2. Product and name of Subcontractor.
 - 3. Name of testing agency and name of inspector.
 - 4. Name of manufacturer's representative present.
 - 5. Date, time, and duration of tests.
 - 6. Type of test, and results. Retesting required.
 - 7. Submit copies of documentation to the Anchorage School District.

1.11 EQUIPMENT START-UP

- A. Verify utilities, connections, and controls are complete and equipment is in operable condition as required by Section 01650.
- B. Observe start-up and adjustments; record time and date of start-up, and results.
- C. Observe equipment demonstrations to Owner; record times and additional information required for operation and maintenance manuals.

1.12 INSPECTION AND ACCEPTANCE OF EQUIPMENT

- A. Prior to inspection, verify that equipment is tested, operational, clean, and ready for operation.
- B. Assist the Anchorage School District with review. Prepare list of items to be completed and corrected.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

FIELD ENGINEERING

PART 1. GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Provide and pay for field engineering services required for project, i.e., civil, structural, or other professional engineering services required to execute Contractor's construction methods.

1.02 RELATED REQUIREMENTS

- A. Conditions of the contract.
- B. Section 01010: Summary of Work.
- C. Section 01700: Project Close Out.

1.03 QUALIFICATIONS OF SURVEYOR AND ENGINEER

- A. Provide Qualified Professional Engineer and Registered Land Surveyor with current Alaska license and acceptable to Contractor and Owner.

1.04 SURVEY REFERENCE POINTS

- A. Locate and protect bench marks, monuments, and other control points prior to starting site work, preserve all permanent points during construction.
 - 1. Make no changes or relocations without prior written notice to Project Manager.
 - 2. Report to Project Manager when any reference point is lost, destroyed or required relocation because of necessary changes in grades or locations.
 - 3. Require surveyor to replace project control points which may be lost or destroyed and establish replacements based on original survey control.

1.05 PROJECT SURVEY REQUIREMENTS

- A. Establish a minimum of two permanent bench marks on site, referenced to data established by survey control points.
- B. Record locations, with horizontal and vertical data, on Project Record Documents.
- C. Establish and identify lines, levels, contours, and datum by instrumentation or similar appropriate means for:
 - 1. Stakes for grading, fill, and topsoil placement.
 - 2. Utility slopes and invert elevations.
 - 3. Batter boards for structures.
 - 4. Building foundation, column locations, and floor levels.
 - 5. Controlling lines and levels required for mechanical and electrical trades.
- D. From time to time, verify layouts by same methods.

1.06 RECORDS

- A. Maintain a complete, accurate log of all control and survey work as it progresses.

1.07 SUBMITTALS

- A. Submit name and address of Surveyor and Professional Engineer to Project Manager.
- B. On request of Project Manager, submit documentations to verify accuracy of field engineering work.
- C. Submit certificate signed by Registered Engineer and Surveyor certifying that elevations and locations of improvements are in conformance with Contract Documents in the form of an "As-Built" survey.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

REGULATORY REQUIREMENTS

PART 1. GENERAL

1.01 BUILDING CODES

- A. Construction which is not governed by a local building code or the Contract Specifications will be governed by the more stringent provisions of the latest published edition of Statute adopted edition with MOA local amendments, of the following applicable codes and regulations:

1. International Building Code (IBC)
2. International Existing Building Code (IEBC)
3. International Energy Conservation Code (IECC)
4. International Fuel Gas Code (IFGC)
5. International Mechanical Code (IMC)
6. International Fire Code (IFC)
7. National Electrical Code (NEC)
8. Uniform Plumbing Code (UPC)
9. ASHRAE 90-75 as applicable to Alaska
10. National Fire Code, Volumes 1-10
11. National Electrical Safety Code
12. NFPA Life Safety Code
13. NFPA National Fire Code
14. ADA Guidelines
15. Accessible and Useable Buildings and Facilities (ICC/ANSI A117.1)

1.02 APPLICABLE STANDARDS

- A. Where indicated, comply with the requirements and recommendations of the standards and other publications, except to the extent more detailed or more stringent requirements are indicated, including those of applicable codes and governing regulations.
- B. Where two or more standards or recommendations of trade associations apply to the same quality control requirement for the work, comply with the most stringent. Refer uncertain instances to the Project Manager for a decision.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

ABBREVIATIONS AND DEFINITIONS

PART 1. GENERAL

1.01 ABBREVIATIONS

- A. References in the contract documents to publications and recommendations by either name or abbreviation thereof include but are not necessarily limited to the following trade associations, technical societies, government agencies, recognized authorities and standards.

AAMA	Architectural Aluminum Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AGA	American Gas Association
AGC	The Associated General Contractors of America
AI	The Asphalt Institute
AIA	The American Institute of Architects
AISC	American Institute of Steel Construction, Inc.
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ANSI	American National Standards Institute
APA	American Plywood Association
ASAHC	American Society of Architectural Hardware Consultants
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
ASME	American Society of Mechanical Engineers
ASTM	American Society for testing and Materials
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWPB	American Wood-Preservers' Bureau
AWS	American Welding Society, Inc.
CPSC	Consumer Product Safety Commission
CRA	California Redwood Association
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard of NBS (U.S. Department of Commerce)
CSI	The Construction Specifications Institute, Inc.
EPA	Environmental Protection Agency
FM	Factory Mutual Engineering Corp.
FGMA	Flat Glass Marketing Association
FS	Federal Specification (General Services Administration)
GA	Gypsum Association
HPMA	Hardwood Plywood Manufacturers Association
IBC	International Building Code
MFMA	Maple Flooring Manufacturers Association
MLMA	Metal Lath/Manufacturers Association
NAAMM	The National Association of Architectural Metal Manufacturers
NBFU	National Board of Fire Underwriters
NBHA	National Builders Hardware Association
NBS	National Bureau of Standards (U.S. Department of Commerce)
NEC	National Electrical Code by NFPA
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
N.F.P.A.	National Forest Products Association
NRCA	National Roofing Contractors Association

NSF	National Sanitation Foundation
NWMA	National Woodwork Manufacturers Association, Inc.
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
RIS	Redwood Inspection Service (Grading Rules)
SDI	Steel Deck Institute
S.D.I.	Steel Door Institute
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association, Inc.
SPR	Simplified Practice Recommendation of NBS
SSPC	Steel Structures Painting Council
TCA	Tile Council of America, Inc.
UL	Underwriters' Laboratories, Inc.
WCLA	West Coast Lumbermen's Association
WCLB	West Coast Lumber Inspection Bureau (Grading Rules)
WRI	Wire Reinforcing Institute
WWPA	Western Wood Products Association (Grading Rules)
W.W. P.A.	Woven Wire Products Association

- B. Refer to individual sections for other names and abbreviations of trade associations and standards applicable to specific portions of the work. In particular, refer to Divisions 23 and 26 for names and abbreviations applicable to mechanical and electrical work.

1.02 SPECIFICATION EXPLANATION

- A. The specifications are divided into divisions and sections for the convenience of writing and using. The titles of these are not intended to imply a particular meaning nor to fully describe the work of each division or section, nor to define the limits of any subcontract.
- B. These specifications are of the abbreviated, or "streamlined" type, and may include incomplete sentences.
- C. Omissions of words or phrases such as "the Contractor shall", "in conformity therewith", "shall be", "as noted on the drawings", "according to the plans", "a", "an", "the", and "all" are intentional.
- D. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the drawings.

1.03 DEFINITIONS

- A. Certain terms used generally throughout the specifications (and drawings) are hereby defined as follows:
1. Indicated: A cross reference to details, notes or schedules on the drawings, other paragraphs or schedules in the specifications, and similar means of recording requirements in the contract documents. Where terms such as "shown", "noted", "scheduled", and "specified" are used in lieu of "indicated", it is for the purpose of helping the reader accomplish the cross reference, and no limitation of location is intended except as specifically noted.
 2. Installer: The person or entity engaged by the Contractor or his Subcontractor or Sub-subcontractor for the performance of a particular unit or work at the project site, including installation, erection, application, and similar required operations. It is a general requirement that installers be recognized experts in the work they are

- engaged to perform.
3. Furnish: Except as otherwise defined in greater detail, the term “furnish” is used to mean “...supply and delivery to the project site, ready for unpacking, assembly and installation...”.
 4. Provide: Except to the extent further defined, the term “provide” means to furnish and install, complete and ready for the intended use.

1.04 DRAWINGS, DIMENSIONS AND MEASUREMENTS

- A. Where on any of the drawings a portion of the work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to all other portions of the work.
- B. Wherever a detail is referenced and developed for a specific condition, same or similar detail shall apply to identical or similar conditions elsewhere on project even though not specifically referenced.
- C. Where the word “similar” occurs on the drawings, it shall be interpreted in its general sense and not as meaning identical, and all details shall be worked out in relation to their location and their connection with other parts of the work.
- D. The figured dimensions on the drawings or notes indicating dimensions shall be used instead of measurements of the drawings by scale, and shall be strictly complied with.
- E. No scale measurements shall be used as a dimension to work with except on “full size” drawings not dimensioned.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

REFERENCED SPECIFICATIONS AND STANDARDS

PART 1. GENERAL

1.01 QUALITY ASSURANCE

- A. For products or workmanship specified by Referenced Specification or Standard, comply with requirements of the specification or standard, except when more rigid requirements are specified or are required by governing codes.
- B. Except where a specific date is specified, the date of the referenced specification standard is that in effect as of the bid date.
- C. Obtain a copy of all Referenced Specifications and Standards and maintain at Jobsite during the specific work until Substantial Completion of the Project.

1.02 SCHEDULE OF REGULATORY AGENCY REFERENCES

- A. AASHTO American Association of State Highway and Trans. Officials
444 North Capitol Street, N.W.
Washington, DC 20001
- B. AAC Anchorage Administrative Code (and Local Amendments)
Municipality of Anchorage
4700 Elmore Rd
Anchorage, AK 99507
- C. ADA Americans with Disabilities Act
The Disabilities Rights Section
Civil Rights Division
P.O. Box 66738
Washington, DC 20035-6738
- D. ANSI American National Standards Institute
1430 Broadway
New York, NY 1018
- E. ASA American Standards Association
Now known as ANSI (See above)
- F. ASTM American Society for Testing Materials
1916 Race Street
Philadelphia, PA 19103
- G. ATBCB The U.S. Architectural and Transportation Barrier Compliance Board
Suite 1000, 131 F St. NW
Washington, DC 20004-1111
- H. CS Commercial Standards of the Commodities
Division of the Department of Commerce
Washington, DC 20006
- I. FM Factory Mutual Engineering and Research Corporation
P. O. Box 688
Norwood, MA 02062
- J. F.S. Federal Specifications of the United States General Services
Administration
Specifications and Consumer Information Distribution Section (WFSIS)

REFERENCED SPECIFICATIONS AND STANDARDS

Division 1
Section 01090

- Washington, DC 20407
- K. IBC International Building Code published by the International Code Council (ICC)
4051 West Flossmoor Road
Country Club Hills, IL 60478-5795
 - L. IEBC International Existing Building Code
Published by ICC (See IBC above)
 - M. ICC/ANSI A117.1-2003
Accessible and Usable Buildings and Facilities
Published by ICC (See IBC above)
 - N. IECC International Energy Conservation Code
Published by ICC (See IBC above)
 - O. IFC International Fire Code
Published by ICC (See IBC above)
 - P. IFGC International Fuel Gas Code
Published by ICC (See IBC above)
 - Q. IMC International Mechanical Code
Published by ICC (See IBC above)
 - R. MOA Municipality of Anchorage MASS Specifications
Public Works Dept.
4700 Elmore Rd
Anchorage, AK 99507
 - S. NBFU National Bureau of Fire Underwriters
85 John Street
New York, NY 10017
 - T. NEC National Electric Code published by the National Fire Protection Association
(See NFPA below)
 - U. NFPA National Fire Protection Association
Battery March Park
Quincy, MA 02269
 - V. PS Product Standards of the Commodities
Division of the Department of Commerce
Washington, DC 20203
 - W. UPC Uniform Plumbing Code
Published by IAPMO
5001 East Philadelphia Street
Ontario, CA 91761-2816
 - X. UL Underwriter's Laboratories
333 Kingston Road
Northbrook, IL 60062
 - Y. State of AK State of Alaska Amendments
Fire and Life Safety Regulations
Juneau, AK

1.03 TRADE ASSOCIATION REFERENCES

- A. See specific specification sections.

REFERENCED SPECIFICATIONS AND STANDARDS

Division 1
Section 01090

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

ALTERATION PROCEDURES

PART 1. GENERAL

1.01 DESCRIPTION OF WORK

- A. Part of alteration work may expose portions of the building to the elements. During such periods Contractor shall take all necessary precautions to protect building elements to remain. Any damage due to negligence shall be repaired at no cost to the Owner.
- B. In addition to Cutting and Patching (Section 01045) and cut, move, or remove items as necessary to provide access or to allow alterations and new work to proceed. Include such items as:
 - 1. Repair or removal of hazardous or unsanitary conditions.
 - 2. Removal of abandoned items and items serving no useful purpose such as abandoned piping, conduit, and wiring.
 - 3. Removal of unsuitable or extraneous materials not marked for salvage, such as abandoned furnishings and equipment, and debris such as rotted wood, rusted metals, and deteriorated concrete.
 - 4. Cleaning of surfaces, and removal of surface finishes as needed to install new work and finishes.

1.02 RELATED REQUIREMENTS

- A. Section 00700 and 00800 - General and Supplementary General Conditions.
- B. Section 01045 - Cutting and Patching.
- C. Section 01300 - Submittals.
- D. Section 01500 - Temporary Facilities and Controls.

1.03 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various Sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and cleanup of Work of separate sections in preparation for Substantial Completion.
- F. After Owner occupancy of premises, coordinate access to site for correction of defective

Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2. PRODUCTS

2.01 ALTERATION PROJECT PROCEDURES

- A. Materials: As specified in Product Sections; match existing Products and work for patching and extending work.
- B. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
- C. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to specified condition.
- D. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.
- E. Where new Work abuts or aligns with existing, perform a smooth and even transition. Patched Work to match existing adjacent Work in texture and appearance.
- F. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation for Project Manager review and approval.
- G. Where a change of plane of 1/8 inch or more occurs, submit recommendation for acceptable transition for Project Manager review and approval.
- H. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- I. Finish surfaces as specified in individual Product Sections.

PART 3. EXECUTION (NOT USED)

END OF SECTION

PROJECT MEETINGS

PART 1. GENERAL

1.01 DESCRIPTION

A. Work Included:

1. In general, project meetings will be held weekly at the job site in accordance with a mutually acceptable schedule. The Project Manager will conduct project meetings throughout the construction period.
2. The purpose of the project meetings is to enable orderly review of progress during construction and to provide for systematic discussion and analysis of problems that might arise between the Owner, Project Architect, Project Manager and/or Contractor relative to execution of the work.

B. Related Work described elsewhere:

1. The Contractor's relations with his subcontractors and material suppliers, and discussions relative thereto, are the Contractor's responsibility as described in the General Conditions and are not part of project meetings content.
2. Section 01400 describes the requirements for quality control meetings that will be held in addition to the requirements of this section.

1.02 AUTHORITY DESIGNATION

- A. Persons designated by the Contractor to attend and participate in project meetings shall have all required authority to commit the Contractor to solutions as agreed upon in the project meetings.

1.03 SUBMITTALS

A. Agenda Items:

To the maximum extent possible, advise the Project Manager forty-eight (48) hours in advance of the project meeting regarding all agenda items to be discussed, including tours in advance of the meeting.

1.04 AGENDA

A. Preconstruction Meeting

1. The Project Manager will conduct this meeting within fifteen (15) days after date of Notice to Proceed.
2. Location:
Anchorage School District
Capital Planning & Construction
1301 Labar Street
Anchorage, Alaska 99515
(907) 348-5190
3. Attendance:
 - a. ASD Construction Supervisor
 - b. ASD Project Manager
 - c. Architect and his Professional Consultants

- d. Contractor's Project Manager and Superintendent
 - e. Major Subcontractors, as appropriate
 - f. Major Suppliers, as appropriate
 - g. Others as appropriate
4. Agenda items will include, but not be limited to:
- a. Designation of responsible personnel
 - b. Distribution (by Contractor) and discussion of list of major Subcontractors and Suppliers with addresses and telephone numbers
 - c. Project coordination
 - d. Procedures and processing of:
 - (1) Field decisions
 - (2) Submittals
 - (3) Proposal requests
 - (4) RFI's Change Orders
 - (5) Applications for Payment
 - (6) Schedules and Reports
 - e. Discussion of initial Project Schedule
 - f. Critical work sequencing
 - g. Major equipment deliveries and priorities
 - h. Adequacy of Contract Documents distribution
 - i. Procedures for maintaining Record Documents
 - j. Use of premises:
 - (1) Office, work, and storage area
 - (2) Owner's requirements
 - k. Construction facilities, controls, and construction aids
 - l. Temporary utilities
 - m. Safety and first-aid procedures
 - n. Security procedures
 - o. Housekeeping procedures
- B. Progress Meetings:
- 1. The Project Manager will conduct weekly meetings as required, at the Project Site to coordinate the work, answer questions, and resolve problems.
 - 2. Meeting Agenda will include but not be limited to:
 - a. Attendees:
List of attendees and company they represent
 - b. Minutes Review:
Corrections, additions, and/or deletions to previous minutes
 - c. Outstanding Action Items:
Review of items not resolved from previous meeting
 - d. Submittal status
 - e. Request for Information status
 - f. Request for Proposal Status
 - g. Schedule Review:
 - h. Project job concerns
 - i. Next meeting
 - j. Summarize and Review of all Action Items:
 - 3. All items to be discussed shall be addressed at the time scheduled on the agenda. All attendees shall familiarize themselves with the agenda and be prepared in advance with their items for discussion.

C. Special Meetings:

The Project Manager may call special meetings at the project site or the office of the Project Manager to coordinate the work, answer questions, and resolve problems.

1.05 MINUTES

- A. The Project Manager will compile minutes of each project meeting and will distribute copies to all interested parties within seven (7) calendar days after the meeting. Items in the minutes shall be numbered consecutively and grouped under divisions and sections. Each item shall be carried forward until resolved.
- B. The minutes compiled by the Project Manager will be the official record minutes and all clarifications and/or corrections shall be transmitted in writing to the Project Manager within fourteen (14) days of date of receipt of the minutes or unless noted during the next scheduled meeting under the appropriate agenda item. Transmitted corrections shall be legibly submitted on company letterhead.
- C. At least one (1) bound volume of all minutes shall be maintained by the Contractor in the job office until project completion.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

SUBMITTALS

PART 1. GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Procedures
- B. Construction Progress Schedules
- C. Schedule of Values
- D. Shop Drawings
- E. Product Data
- F. Samples
- G. Manufacturer's Instructions
- H. Manufacturer's Certificates

1.02 RELATED REQUIREMENTS

- A. Section 01010 - Summary of Work
- B. Section 01311 - Project Schedule
- C. Section 01340 - Shop Drawings, Product Data and Samples
- D. Section 01370 - Schedule of Values
- E. Section 01400 - Quality Control
- F. Section 01630 - Substitution and Product Options
- G. Section 01700 - Project Close Out
- H. Section 01710 - Cleaning
- I. Section 01720 - Project Record Documents
- J. Section 01730 - Operating and Maintenance Data
- K. Section 01750 - Closeout Forms

1.03 PROCEDURES

- A. Deliver submittal documents to the Project Manager using the ASD Procore Construction Management Program. Number each submittal with the section number, dash, numerical order of the submittal, example 03300-1. Add an alpha to each resubmittal, example, 03300-1A. Deliver samples to the Project Manager or Architect as directed to the address listed on the cover of the project manual.

- B. Transmit each item with company submittal. Identify Project, Contractor, subcontractor, major supplier; identify pertinent Drawing sheet and detail number and specification section number, as appropriate. Identify deviations from Contract Documents. Provide space for Contractor and Architect/Engineer review stamps.
- C. Submit initial progress schedules and schedule of values in duplicate prior to issuance of Notice to Proceed. After review by the Architect/Engineer, revise and resubmit as required. Submit revised schedules with each application for payment, reflecting changes since previous submittal.
- D. Comply with progress schedule for submittals related to work progress. Coordinate submittal of related items.
- E. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions. Review with subconsultants/suppliers any inability to meet requirements of project. Find solutions with subconsultants/suppliers making conformance with documents possible. Review solutions with owner and architect for acceptance prior to proceeding with work.

1.04 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit Project Schedule as called for in Section 01311, Project Schedule.

1.05 SCHEDULE OF VALUES

- A. Submit Schedule of Values as called for in Section 01370, Schedule of Values.

1.06 SHOP DRAWINGS, PRODUCT DATA & SAMPLES

- A. Submit in the form as called for in Section 01340.

1.07 MANUFACTURERS' INSTRUCTIONS

- A. When required in individual specification section, submit manufacturers printed instructions for delivery, storage, assembly, installation adjusting and finishing, in quantities specified for product data.

1.08 FIELD SAMPLES

- A. Provide field samples of finishes at project site as required by individual specification sections. Install sample complete and finishes. Acceptable samples in place may be retained in completed work.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

PROJECT SCHEDULE

PART 1. GENERAL

1.01 GENERAL REQUIREMENTS

- A. The work under this Section consists of Project Schedule (“Schedule”) requirements including the preparation of a Schedule and Schedule Revisions. The Schedule shall be developed by the Contractor and shall be in accordance with the requirements of this Section 01311. No direct payment will be made to the Contractor for performing and complying with the requirements of this Section 01311.
- B. The Schedule will be prepared by the Contractor for this Project and made available to the Owner. It is intended that the Schedule will reflect the Contractor’s actual construction plan. The existence of schedules, networks, vector charts or any other charts or services, shall in no way relieve the Contractor of the responsibility of the Contract Document including, but not limited to the responsibility of completing the Work within the contract time and the responsibility of planning, scheduling and coordinating the Work.
- C. The Schedule shall be in the form of a bar chart or other format approved by the project manager.

1.02 REFERENCES

- A. Associated General Contractors of America, “Construction Planning & Scheduling,” Copyright January 1994 (AGC’s Manual), also referred to as AGC Publication No. 1107.1. The general principles stated in the AGC’s Manual shall be used in preparing and updating the Project Schedule, except that the requirements of this Section shall govern.
- B. Related Requirements:
 - 1. Section 00700 and 00800 - General Conditions and Supplementary General Conditions
 - 2. Section 00200 - Project Schedule Milestones Dates
 - 3. Section 01370 - Schedule of Values

PART 2. PRODUCTS

2.01 PROJECT SCHEDULE

- A. Within fourteen (14) calendar days following the Notice to Proceed, the Contractor shall submit for the Project Manager’s review, comment and acceptance, a Project Schedule (“Schedule”). The Schedule shall show the activities of work in sufficient detail to demonstrate that the Contractor has a reasonable and workable plan to complete the Project in accordance with the Project Schedule Milestone Dates set forth under Section 00200 of the Contract Documents. The Contractor shall submit two (2) prints of the Schedule, which shall be neatly organized and time scaled from left to right on 11 in. x 17 in. sheets, or 24 in. x 36 in. sheets, at the Contractor’s discretion.
- B. Within five (5) calendar days of receipt of the Schedule, the Project Manager shall meet face to face with the Contractor to review the plan and to determine if there are any concerns regarding the Contractor’s plan to execute the work. If a resubmittal of the Schedule is required by the Project Manager, the Contractor shall revise and resubmit the Schedule incorporating the Project Manager’s comments within seven (7) calendar days after this review meeting. Progress payments will be withheld until the Contractor submits an approvable Schedule.

C. Revisions to the Schedule shall be done in accordance with paragraph 2.02.

2.02 PROJECT SCHEDULE REVISIONS

A. Should the Contractor, after acceptance of the Schedule, desire to change his plan of construction, he shall submit his proposed revisions to the Project Manager, along with a written rationale for the revisions. Only the requested changes accepted by the Project Manager will be incorporated into the Schedule in the next reporting period.

2.03 TIME IMPACT ANALYSIS FOR CONTRACT MODIFICATIONS, CHANGES OR DELAYS

A. If the Contractor believes that a change under Article 12 Paragraph 12.1 causes an increase or decrease in the Contractor's time for completing the Work, he shall complete a Time Impact Analysis that demonstrates how the Contractor proposes to incorporate or has incorporated the Change into the Schedule and the time impact, if any, on the Schedule Milestone Dates set forth under Section 00200 of the Contract Documents.

1. The Time Impact Analysis shall demonstrate the time impact based upon the date the Change in Work is directed by the Project Manager; the status of construction at that point in time; and the event time computations of all affected activities. The event times used in the Time Impact Analysis shall be those set forth in the update of the Schedule in effect at the time the Change in Work is directed by the Project Manager.
2. The Time Impact Analysis is based on an "as-planned" to "as-built" comparison of the event times. In developing an as-built schedule of performance, the Contractor shall utilize actual daily performance data from Schedule Updates and the Contractor's daily construction reports to graphically depict the sequence and manner in which the Contractor actually performed the Work under the Contract.

B. Activity delays shall not automatically mean that an extension of the Contract Time is warranted or due the Contractor. It is possible that a modification, change or delay will not affect projected or as-built critical activities or cause non-critical activities to become critical. A modification, change or delay may result in only absorbing a portion of the available total float that may exist within an activity chain of the Schedule, thereby not causing any effect on the Contract Time.

C. Each Time Impact Analysis shall be submitted as follows:

1. Within fourteen (14) calendar days after receipt of a written order designated or indicated to be a change in accordance with Article 12, Changes in the Work;
2. Within fourteen (14) calendar days after the furnishing of written notice by the Contractor;
3. Within fourteen (14) calendar days from the commencement of a delay related to unforeseeable conditions; provided the Contractor complies with the requirements of the Contract Documents regarding said condition.

D. In cases where the Contractor does not submit a written request for extension of time and Time Impact Analysis within the time stated above in Paragraph 2.03, it is mutually agreed that the Change in the Work does not require an extension of the Contract Time.

E. Acceptance or rejection of each Time Impact Analysis which requests an extension of the Contract Time shall be made by the Project Manager within fourteen (14) calendar days after receipt of each Time Impact Analysis, unless subsequent meetings and negotiations are necessary. Upon acceptance, the Time Impact Analysis shall be incorporated into the Schedule.

F. Time Impact Analysis related to requests for an extension of the Contract Time and/or Change Order work shall be incorporated into and attached to the applicable Change Order(s).

- G. No revision to any Schedule Milestone Date or contractually mandated schedule provisions will be permitted without authorization from the Project Manager.

2.04 COMPLIANCE WITH THE SCHEDULE

- A. The Contractor shall furnish sufficient labor and equipment resources, offices, and facilities, and shall work such hours, including night shift and overtime operations as necessary, to ensure the prosecution of the Work in accordance with the Schedule. If the Contractor falls behind in meeting the Schedule, the Contractor shall take such steps as may be necessary to improve its progress. If the Contractor fails to take such steps, the Project Manager may require the Contractor to increase the hours of work, the number of shifts, overtime operations, the number of workers and/or the amount of construction plant and equipment without additional cost to the Owner. The provisions of this subsection shall not be construed as prohibiting work on Saturdays, Sundays, and holidays, if the Contractor so elects and gives 24 hours' notice to the Project Manager.
- B. Failure of the Contractor to comply with the requirements of this Subsection 2.04 shall be a basis for determination by the Project Manager that the Contractor is not prosecuting the Work with such diligence as will ensure completion of the Work in accordance with the requirements of the Contract Documents. Upon such determination, the Project Manager may terminate the Contractor's right to proceed with the Work or any separable part thereof, in accordance with the clause entitled "Termination of Contract" of the Contract Documents, or may take such other actions as he may deem appropriate.

PART 3. EXECUTION (NOT USED)

END OF SECTION

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 DESCRIPTION

- A. Prepare and submit to the Project Manager with the Construction Schedule, a separate schedule listing dates for submission and of review for shop drawings, product data, and samples, refer to General Conditions 4.12.13.1. Include installing Subcontractors name responsible for that portion of the Work
- B. Submit Shop Drawings, Product Data, and Samples as may be required, whether mentioned specifically in Contract Documents or not.
- C. Individual submittals shall not include material covering more than one section of the specifications.
- D. Products fabricated and/or installed prior to approval of submittals are subject to demand for removal and replacement with approved products by the Contractor at no additional cost to the Owner.
- E. Shop drawing submittal cannot be used for product substitution submittal. See Section 01630 for required procedure.

1.03 RELATED REQUIREMENTS

- A. Section 01311: Project Schedule
- B. Section 01630: Substitution and Product Options
- C. Section 01720: Project Record Documents

1.04 SHOP DRAWINGS

- A. Prepare original drawings (by Contractor, subcontractor, manufacturer, supplier, or distributor), which illustrate some portion of the work, showing fabrication, layout, setting or erection details.
- B. Prepare shop drawings for this particular project. Drawings prepared for other projects and revised for this project will be rejected.
- C. When necessary, base shop and setting drawings upon actual measurements taken at site and other job conditions. Show any variations and revisions to Contract Documents that are necessary for proper installation of work. Fabrication or installation of work shall not be started until shop or setting drawings have been reviewed and returned by Architect, with his stamp and comments.
- D. Identify details by reference to sheet and detail, schedule or room numbers shown on Contract Drawings.

- E. Minimum sheet size: 8 ½" x 11". Note: Submit full-size sheet submittals. Use of 8 ½" x 11" format subject to readability and approval of architect.

1.05 PRODUCT DATA

- A. Manufacturer's standard schematic drawings:
 - 1. Modify drawings to delete information which is not applicable to project.
 - 2. Supplement standard information to provide additional information applicable to project.
- B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data.
 - 1. Clearly mark each copy and identify pertinent materials, products or models.
 - 2. Show dimensions and clearances required.
 - 3. Show performance characteristics and capacities.
 - 4. Show wiring diagrams and controls.
 - 5. Catalog cuts and descriptive data sheets shall include a complete listing of repair and replacement parts for all equipment and the name and address of a source of supply for parts and service.

1.06 SAMPLES

- A. Physical examples to illustrate materials, equipment or workmanship and to establish standards by which completed work is judged.
- B. Office Samples: Of sufficient size and quantity to clearly illustrate:
 - 1. Functional characteristics of product or material, with integrally related parts and attachment devices.
 - 2. Full range of color, texture and pattern.
- C. Field Samples and Mock-Ups:
 - 1. Erect at project site at location acceptable to Project Manager.
 - 2. Construct each sample or mock-up complete, including work of all trades required in finished work.
 - 3. After review, samples may be used in construction of Project.

1.07 SUBMITTAL REQUIREMENTS

- A. Make all submittals far enough in advance of scheduled dates for installation to provide all required time for review, for securing necessary approvals, for possible revision and resubmittals and for placing orders and securing delivery. Submission of all shop drawings shall be through the General Contractor.
- B. The contractor shall allow at least 14 days for review of original submittals or resubmittals except as follows:
 - 1. Structural steel shop drawings shall be broken down into separate submittal packages for most efficient review and delivered at least two weeks apart.
 - 2. Division 23
 - a. Plumbing shop drawings - 21 days
 - b. Heating shop drawings - 21 days
 - c. Ventilation shop drawings - 28 days
 - d. Coordination shop drawings - 21 days

3. Division 26
 - a. Special Systems shop drawings - 21 days
- C. Submit one (1) reproducible unfolded transparency print of shop drawing. Upon Architects approval, Contractor shall provide five (5) opaque prints for owners use. Transparency will be returned to Contractor for printing and distribution as needed. Additional copies will be returned without review or mark-ups.
- D. Submit four (4) each of samples.
- E. Unless otherwise specifically permitted by the Project Manager, make all submittals in groups containing all associated items. Partial submittals may be rejected.
- F. Accompany submittals with transmittal letter, in duplicate, containing:
 1. Date
 2. Project Title and number
 3. Contractor's name and address
 4. The number of each shop drawing, product data and sample submitted
- G. Submittals shall include:
 1. Date and revision dates
 2. Project title and number
 3. The name of:
 - a. Architect
 - b. Contractor
 - c. Subcontractor
 - d. Supplier
 - e. Manufacturer
 - f. Separate detailer when pertinent
 4. Identification of product or material
 5. Relation to adjacent structure or materials
 6. Field dimensions, clearly identified as such
 7. Specification section number
 8. Applicable standards, such as ASTM number or Federal Specifications.
 9. A blank space, for Architect's review stamp

1.08 CONTRACTOR RESPONSIBILITIES

- A. Review shop drawings, product data, and samples prior to submission.
- B. Include noted and required corrections and indicate by stamp and signature that submittal is acceptable to Contractor. Submittals without stamp and signature will be rejected.
- C. Verify:
 1. Field measurements.
 2. Field Construction criteria.
 3. Conformance with specifications.
- D. Coordinate each submittal with requirements of work and Contract Documents.
- E. Contractor's responsibility for errors and omissions in submittals is not relieved by Architect's review and approval.
- F. Contractor's deviations in submittal requirements shall not relieve Contractor from

completing Contract requirements.

- G. The submittal documents shall be transmitted using the ASD Procore Construction Management Program. Number the submittals with the CSI Section then a dash then the numerical order (01650-1). Resubmittals shall have the same number with an alpha at the end. (01650-1A).
- H. Contractor shall update the Procore Submittal Log on a weekly basis until Submittal Process is complete.

1.09 RESUBMITTAL REQUIREMENTS

- A. Revise initial drawings as required and resubmit as specified for initial submittal.
- B. Indicate on drawings any changes which have been made other than those requested by the Architect.
- C. Project data and samples: Submit new data and samples as required for initial submittal.

1.10 ARCHITECT'S DUTIES

- A. Review submittals with a turn-around time for review of original or resubmittal of no more than fourteen (14) calendar days, except as indicated in paragraph 1.07 B above.
- B. The review will be for conformance to the design concept and compliance with information given in the Contract Document. The Architect will make notations directly on the reproducible.
- C. The review is intended to foresee unacceptable products to avoid the possibility of their rejection at the site. The review shall not be construed as:
 - 1. Permitting a departure from the Contract Documents, unless specifically so noted.
 - 2. Relieving the Contractor of the responsibility for errors or omissions.
 - 3. Acceptance of an assembly in which an approved item is a part.
 - 4. Approval of variations from previously approved items.
 - 5. Approval of dimensions.
- D. The Architect will review all samples. Such review will be for appearance only. Compliance with all other requirements is the responsibility of the Contractor.
- E. Affix stamps and initials or signatures certifying the review of submittal.
- F. Where the Contract Documents require the design of the structural, mechanical, or electrical systems or components of systems by a supplier, such systems or components shall be designed by a registered professional engineer and all calculations submitted to the Architect for his records, prior to starting fabrication or installation of the work. The Architect will not be responsible for the designs of such other Professionals.

1.11 VARIATIONS FROM CONTRACT DOCUMENTS

- A. See Section 01630 for procedure.
- B. If the Contractor fails to mention variations from the Contract Documents, he will not be relieved of the responsibility for executing the work in accordance with the Contract Documents.

1.12 SUBMITTALS FOR COLOR SELECTION

- A. The Contractor shall take particular note that color selections cannot be made for the project until such time as all items requiring color selection have been submitted. After such submittal has been made, the Architect with Owner's concurrence will within fourteen (14) days, make a complete color selection for the entire project.
- B. It will be the contractor's responsibility to review the Contract Documents completely to determine items requiring color selection, obtain color samples from the manufacturer and submit to the Architect at the earliest possible date.

1.13 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

- A. Contractor shall distribute copies of shop drawings and product data which carry Architect's stamp, to:
 - 1. Contractor's file (required)
 - 2. Job-site file (required)
 - 3. Record Documents file (required)
 - 4. Other prime Contractors (as required)
 - 5. Subcontractors (as required)
 - 6. Supplier (as required)
 - 7. Fabricator (as required)
 - 8. Others (as required)

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

AIRBORNE CONTAMINANT CONTROL

PART 1 - GENERAL

1.01 SUMMARY:

A. Related sections:

1. Section 02 26 00 Hazardous Materials Assessment
2. Section 02 41 19 Selective Demolition
3. Section 02 81 00 Hazardous Materials – Summary of Requirements

B. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 DEFINITIONS:

A. "Airborne Contaminants" are those contaminants listed in 29 CFR 1926.55 and 8 AAC 61.1100 that have the potential to become airborne due to various work activities being performed by the Contractor. Additionally, airborne contaminants include those fumes and odors that may be objectionable to personnel in Occupied Areas of the facility even though they are not listed in the reference regulations. Airborne contaminants may be broadly categorized as Pre-Existing or Activity Generated. Contaminant producing activities include, but are not limited to:

1. Demolition, removal, installation and disposal of walls, floors, ceilings, steel, and other architectural or structural materials.
2. Disturbance or removal of existing settled and concealed dusts.
3. Demolition, relocation, installation and disposal of plumbing, mechanical and electrical systems and equipment.
4. Finish operations such as sanding, preparation, painting, and application of special surface coatings.
5. Any construction activity, which can generate aerosols, dust, smoke, or fumes.
6. Temporary heat sources.
7. Other on-site work operations not described above.

B. "Pre-Existing Contaminants" are those contaminants that are present in the facility prior to the start of any work. These contaminants, including asbestos and lead, are also present in settled and concealed dust throughout the building in areas not subject to routine cleaning, including the roof and inside and on top of architectural, mechanical, electrical and structural elements. The dust generally contains several common components including, but not limited to asbestos, cellulose, cotton, fiberglass, lead, silica and other Particulates Not Otherwise Regulated. Representative dusts throughout the facility have been examined and previously sampled by an EPA Certified Building Inspector and determined not to be "asbestos debris" from adjacent "Asbestos-Containing Building Materials" (ACBM). Based on similar sampling from similar buildings, the inspector also determined that the dusts do not contain more than one percent (1%) asbestos by weight, and therefore are not an asbestos-containing material (ACM). Reference 40 CFR 763.83 for asbestos, and 29 CFR 1926.1153 for silica. Refer to Section 02 26 00, Hazardous Materials Assessment. Dust and debris related to adjacent damaged asbestos containing

materials are addressed in Section 02 82 33, Removal and Disposal of Asbestos Containing Materials.

- C. "Activity Generated Contaminants" are those contaminants generated by the various demolition or construction related activities of the Contractor. Examples of typical Activity Generated Contaminants include wood dust (cellulose), cement dust (silica), gypsum dust (particulates not otherwise regulated), paint fumes, and welding fumes. A complete list of regulated air contaminants is available in 29 CFR 1926.55 and 8 AAC 61.1100.
- D. "Work Areas": Areas of demolition, renovation, construction, adjacent staging and storage areas, and passage areas for workers, supplies, and waste. This may include but is not limited to attic spaces, spaces above ceilings, crawl spaces, mechanical and electrical spaces, confined spaces and other spaces not normally accessed or occupied.
- E. "Occupied Areas": Areas as determined by Owner's Representative and as shown on contract drawings. Typically these include areas adjacent to Work Areas or containment areas, either occupied or used for passage, as well as areas connected to construction area by mechanical system air intake, exhaust, and ductwork. Contaminant control procedures may be relaxed during periods when school is not in session as allowed by the Contractor's approved work plan.
- F. "Critical Clean Areas": Areas inside or outside the Work Area with equipment or occupants that cannot tolerate airborne contamination, and are to be maintained under positive pressure by High-Efficiency, Particulate, Air (HEPA) filtered equipment relative to the surrounding air. These areas will be described or shown in contract documents or drawings.
- G. "Contractor" is defined to include all trades and all subcontractors performing work on the work site.
- H. "Negative Initial Determination" is a determination made either through air monitoring or other objective data that indicates worker exposure to regulated airborne contaminants are below or expected to be below the regulated limits.

1.03 AIRBORNE CONTAMINANT CONTROL

- A. There is no requirement to remove Pre-Existing Contaminants from the facility. The Contractor may remove Pre-Existing Contaminants from their work areas if they determine that to be a more cost effective means of completing the work.
- B. The Contractors shall establish and maintain control over the generation and containment of all potential airborne contaminants so that workers, facilities, students, staff, educational programs, equipment, and operations are not adversely affected, including adverse effects on air monitoring. Construction activities that disturb existing materials or create airborne contaminants must be conducted in Work Areas specifically constructed, ventilated, and/or equipped to prevent the movement of contaminants into Occupied or Critical Clean Areas.
- C. The Contractor shall establish and maintain control over Activity Generated Contaminants within the Work Area to prevent abnormally high levels of airborne contaminants from settling on architectural, mechanical, electrical or structural components within the work areas, or interference with monitoring conducted for other work. The Contractor shall be required to clean all surfaces within a work area where abnormally high levels of Activity Generated Contaminants are deposited.
- D. The Contractor shall ensure that all workers are aware of the Occupied and Critical Clean Areas, the potential air contaminants present and the means and methods established in the work plan to control those contaminants.
- E. The Contractor shall ensure workers have the proper protective equipment needed for the job being performed.

1.04 TRAINING

- A. The Contractor shall ensure that all workers/trades performing work on the project site are trained in accordance with OSHA standards for hazard communication (29 CFR 1910.1200) and proper protective equipment (29 CFR 1926), as well as engineering controls and work methods required to prevent exposure to regulated air contaminants that might be generated or encountered as a result of their work, including 29 CFR 1926.1153.

1.05 RESPONSIBILITY:

A. Owner's Responsibilities

1. The Owner shall identify in contract documents Occupied Areas and Critical Clean Areas prior to allowing the Contractor to begin work. The Contractor shall be notified of all changes to these areas as work progresses.

B. Contractor's Responsibilities:

1. Preparing proposed work plans and procedures for control of airborne contaminants during demolition and construction.
2. Identifying and implementing specific means and methods of achieving and maintaining control of airborne contaminants.
3. Controlling the generation and spread of airborne contaminants from the Contractor's Work Areas.
4. Cleaning and decontaminating all areas contaminated as the result of their operation. The Owner has the right to review and approve of any and all clean-up and decontamination procedures, chemicals, and processes.
5. Notifying Owner's Representative a minimum of 48 hours prior to starting construction activities that might be expected to produce excess levels of airborne contaminants in Work Area so that precautions may be taken.

1.06 SUBMITTALS:

- A. Submittals Required: Submit the following documentation to the Owner for approval. The submittal shall be coordinated with all the Contractor's subcontractors and trades and be submitted as one submittal for all work covered by this section. **WORK SHALL NOT PROCEED UNTIL THE SUBMITTAL PACKAGE IS APPROVED, AND THE PRE-CONSTRUCTION MEETING HAS BEEN HELD.**

1. Shop Drawings: Make all shop drawings accurately and to a scale sufficiently large to show all pertinent features of the work. Shop Drawings shall show:
 - a. Boundaries of each Work Area, Occupied Areas and Critical Clean Areas.
 - b. Location of barriers, negative pressure areas, positive pressure areas, and exhaust fan units (if required).
 - c. Locations of windows, louvers, ducts and other penetrations into Occupied Areas and/or Critical Clean Areas that need to be protected from airborne contamination.
 - d. Disposal Routes.
 - e. Locations of contaminant producing operations like painting or sanding which could be moved away from Occupied Areas.
2. Work Plan: The Work Plan shall be prepared for this specific job in the form of checklists and shall include:
 - a. Work area set-up and protection procedures during occupied times.
 - b. Work area set-up and protection procedures during periods of limited occupancy (vacation and holidays).
 - c. Work procedures to minimize generation of airborne contaminants, including a written exposure control plan.
 - d. Worker protection procedures.

- e. Daily cleanup procedures and activities.
 - f. Procedures to follow if air contaminants enter Occupied or Critical Clean Areas.
 - g. Exposure assessment procedures if a “negative initial determination” has not been completed (note that negative initial determinations are not allowed related to silica exposure). A record of “negative initial determinations” shall be maintained by the Contractor and be available on the job site for review by the Owner or regulatory agencies.
3. Safety Data Sheets (SDSs): The Contractor shall maintain on the job site, at a location approved by the owner, SDSs for each encapsulant, surfactant, solvent, detergent, and other material proposed to be used.
- B. Monitoring Results: The Contractor shall submit copies of all air monitoring and testing results to the Owner within 24 hours of receipt of results.

1.07 WORKER PROTECTION:

- A. The Contractor shall review the SDS's for the substances that will be used, data provided by these specifications, proposed means and methods, manufacturers data and other available data to determine the potential for worker exposure.
- B. Conduct air monitoring of worker exposures as necessary to show that workers are not being exposed above the permissible exposure limits established by 29 CFR 1926 and 8 AAC 61.1100 (negative initial determination). Not all contaminants or substances will require exposure monitoring. All sampling by the Contractor shall be at their own cost.
- C. In lieu of worker exposure monitoring, the Contractor may rely on objective data from recognized trade groups, manufacturer or previous exposure monitoring data that establish that worker exposure above the permissible exposure limits is not probable under conditions “closely resembling” the processes, types of materials, control methods, work practices and environmental conditions in the current job.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION

3.01 WORK PRACTICES:

- A. General: All construction/demolition work shall be isolated, either by enclosures, and/or work practices and equipment to prevent worker exposures above the permissible exposure limit(s), and prevent the migration of contaminants (dust, fumes, smoke, etc.) into Occupied Areas and Critical Clean Areas of the facility. Exposures to occupants shall be maintained at least 10 times lower than the permissible exposure limit(s) for airborne contaminants. Conduct disturbance of concrete, brick, stone, mortar, etc. in accordance with 29 CFR 1926.1153 related to crystalline silica. If the Contractor's work practices are not effective in controlling airborne contaminants, as evidenced by dust, fumes, smoke, odors, etc. in Occupied or Critical Clean Areas, the Contractor shall provide a sealed barrier at the perimeter of the work area and exhaust the work area to maintain a negative pressure and/or provide a filtered positive pressure to Critical Clean and Occupied areas to keep airborne contaminants out. Maintain a positive pressure of 0.05 inches of water column relative to the air outside the Critical Clean Areas, with a minimum 100 feet per minute velocity through cracks, openings, etc.
- B. Direct exhaust from fume or smoke producing equipment away from building air intakes, windows and other penetrations into Occupied and Critical Clean Areas.
- C. The Contractor shall provide “walk-off” mats, at all connections between Work Areas and Occupied Areas, vacuumed or changed daily when there is traffic between the Work Area and the Occupied Areas.

- D. Enclosures, where used, shall be dust tight and withstand air pressure.
- E. Prohibited Materials: The use or application of the following materials is prohibited:
 - 1. All cleaners and aerosol products not submitted and approved by the Owner.
 - 2. All flammable or chlorinated hydrocarbon solvents, unless approved by the Owner.
- F. Any dust or debris tracked outside of Work Areas into Occupied Areas shall be cleaned up immediately. Contractor shall have the necessary manpower and equipment (dust and wet mops, HEPA vacuums, buckets and clean wiping rags) to keep adjacent Occupied Areas clean at all times.
- G. Dry Sweeping is prohibited. All vacuums used for cleaning shall be equipped with HEPA filters.
- H. Traffic between Work Areas and Occupied Areas shall be kept to a minimum. Keep doors between such areas closed at all times. Transport refuse through Occupied Areas in covered containers.
- I. Notify the Owner's Representative immediately of any release of airborne contaminants into Occupied Areas.

3.02 ENFORCEMENT:

- A. The Contractor shall periodically inspect Occupied Areas at the perimeter of the work area and Critical Clean Areas to verify that airborne contaminants have not spread into those areas.
- B. Failure to properly maintain airborne contaminant control in Work Areas, Occupied or Critical Clean Areas will result in issuance of a written warning. If the problem is not corrected immediately, the Owner will have cause to stop work.
- C. Failure of the Contractor to correct deficiencies in controlling airborne contaminants will result in corrective action taken by the Owner and deduction of all costs from the Contract.

3.03 WORK STOPPAGE:

- A. The Contractor shall stop work and notify the Owner whenever his work has caused visible dust, smoke, fumes or objectionable odors in Occupied or Critical Clean Areas.
- B. When such work stoppage occurs, the area shall be restored to its original condition by the Contractor at no expense to the Owner. The Contractor is responsible for removing dust, fumes and debris that were generated as a result of his work.

3.04 WORK COMPLETION:

- A. Provide thorough cleaning of finished surfaces that become exposed to dust or other airborne contaminants. Cleaning of Pre-Existing contaminants is not required.
- B. Removal of construction barriers and airborne contaminant control equipment shall be performed in a manner to minimize disturbance of airborne contaminants into occupied spaces. HEPA vacuum and clean all finished surfaces free of dust after the removal of barriers and equipment.

END OF SECTION

SCHEDULE OF VALUES

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 REQUIREMENTS INCLUDED

- A. Procedures for preparation and submittal of Schedule of Values.

1.03 RELATED REQUIREMENTS

- A. Section 00700 - General Conditions and Section 00800 Supplemental Conditions of the Construction Contract.
- B. Section 01311 – Project Schedule.

1.04 FORMAT

- A. Schedule of Values shall be submitted on ASD Form 100B.

1.05 CONTENT

- A. List installed value of each major item of work and each subcontracted item of work as a separate line item to serve as a basis for computing values for progress payments. Round off values to nearest dollar.
- B. For each major subcontract, list products and operations of that subcontract as separate line items.
- C. Include work allowances within line item of work.
- D. Coordinate listings with progress schedule.
- E. Component listings shall each include a directly proportional amount of Contractor's overhead and profit.
- F. For items on which payments will be requested for stored products, list the cost of stored products.
- G. The sum of values listed shall equal total contract sum.
- H. In addition to the above, values shall be listed for the following close out items.
 - 1. As-builts.
 - 2. O & M Manuals.
 - 3. Warranties.
 - 4. Landscape Maintenance Warranty.
 - 5. Owner Training.
 - 6. Demobilization (If mobilization is itemized).
 - 7. Project close-out must retain a minimum of \$25,000.00.

1.06 SUBMITTAL

- A. Transmit under transmittal letter. Identify project by title and contract number.

1.07 SUBSTANTIATING DATA

- A. When the Project Manager requires substantiating information, submit data justifying line item amounts in question.
- B. Provide one copy of data with cover letter for each copy of application. Show application number, date and line item by number and description.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

CONSTRUCTION PHOTOGRAPHS

PART 1. GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Construction Photographs.
- B. Submittals.

1.02 RELATED REQUIREMENTS

- A. Section 01720 - Project Record Documents

1.03 PHOTOGRAPHY

- A. Provide photographs of construction throughout progress of work.
- B. Take photographs prior to covering completed work.
- C. Take photographs at beginning and completion of elements of construction.
 - 1. Asbestos Abatement process indicating the phases of abatement including:
 - a. Existing Conditions
 - b. Preparation Prior to Start of Work
 - c. Work in Progress
 - d. Completed Work
 - e. Equipment used for Abatement Processes
 - 2. Roof demolition
 - a. Repairs
 - b. Documentation of interim building protection measures
 - c. Work in Progress
 - d. Completed work
 - e. Include roof designation and locations
 - 3. Air infiltration and/or vapor barrier installation
 - 4. Insulation installation
 - 5. Final completion.
- D. The Contractor, on a daily basis, shall photograph the demolition and abatement process. For their own use and distribution, the Project Manager shall on a regular basis, direct photographs and/or video recordings of construction operations and work in progress.

1.04 IMAGES

- A. Digital images to be uploaded to the ASD Procore Construction Management Program Project Folder daily.
- B. Photo file name to include location, item photographed and orientation of view.

1.05 TECHNIQUE

- A. Provide factual presentation.
- B. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field and minimum distortion.
- C. The Contractor shall furnish access, labor and facilities to assist photographer(s). Photographs shall be taken with a Digital type camera with flash attachment in working order.
 - 1. Furnish the Project Manager with a quantity equal to minimum ten (10) photographs per work area per day ISO appropriate to lighting conditions.

1.06 VIEWS

- A. Consult with Project Manager for instructions on views required.
- B. Locations of photos. It is preferred to have similar angles and locations of existing conditions, in progress and complete photos.

1.07 SUBMITTALS

- A. All photos to be loaded in Procore and labelled.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

QUALITY CONTROL

PART 1. GENERAL

1.01 RELATED REQUIREMENTS

- A. Section 00700 - General Conditions and Section 00800 – Supplemental Conditions to the Construction Contract.
- B. Section 01090 - Reference Specifications and Standards.
- C. Section 01300 - Submittals.
- D. Section 01410 - Testing Laboratory Services.
- E. Section 01420 - Special Inspections

1.02 GENERAL REQUIREMENTS

- A. The contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with this section. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence.

1.03 QUALITY CONTROL PLAN

- A. The Contractor shall furnish for review by the Owner, not later than 30 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of this section. The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used.
 - 1. Content of the CQC Plan: The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:
 - a. A description of the quality control organization, including the name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function, including the person assigned responsibility of CQC manager.
 - b. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will be approved by the Owner.)
 - c. Procedures for tracking preparatory and follow-up control phases, verification, and acceptance tests, including documentation.
 - d. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.
 - e. Reporting procedures, including proposed reporting formats.
 - f. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section.
 - 2. Acceptance of Plan: Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Owner reserves the right to require the

Contractor to make changes in the CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3. Notification of Changes: After acceptance of the CQC Plan, the Contractor shall notify the Owner in writing of any proposed change. Proposed changes are subject to acceptance.

1.04 COORDINATION MEETING

- A. After the Preconstruction Conference and before start of construction, the Contractor shall meet with the Project Manager to discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 15 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship with the Owner's special inspection personnel. Minutes of the meeting shall be prepared by the Contractor and signed by both the Contractor and the Project Manager.

1.05 QUALITY CONTROL ORGANIZATION

- A. CQC Manager: The Contractor shall identify as CQC Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC Manager shall be a person with a minimum of ten (10) years' experience in construction with a minimum of three (3) years' experience in Quality Control Management or Construction Inspection, preferably with some formal Quality Control training. This CQC Manager shall be on the site at all times during construction and shall be employed by the prime Contractor.
- B. CQC Personnel: In addition to CQC personnel specified elsewhere in the contract, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC Manager for the following areas: electrical, mechanical, structural, and architectural. Each of these individuals must have either an engineering degree in their respective field and two years of experience or five (5) years of related experience. These individuals are to be responsible to the CQC Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with this section. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan.
- C. ASD CQC Testing Requirements: See Attachment 1 below.

ASD CQC TESTING REQUIREMENTS

MATERIAL TESTED	CHARACTERISTIC TESTED	SAMPLE FREQUENCY	SAMPLING POINT	REPORT DUE
CLASSIFIED FILL MATERIAL AND BACKFILL (TYPE II, TYPE IIA, BLENDED, ETC.)	GRADATION	1 PER SOIL TYPE AND NOTABLE CHANGE IN CHARACTERISTICS	PRIOR TO PLACEMENT	BEFORE USE ON PROJECT
	MOISTURE DENSITY (PROCTOR)			
	COMPACTION/DENSITY	STRUCTURAL = 1 PER LIFT & PER 500 S.F. TRENCHES = 1 PER LIFT & PER 150 L.F. FLATWORK = 1 PER LIFT & PER 5000 S.F.	IN PLACE	PRIOR TO NEXT LIFT
	GRADATION			

QUALITY CONTROL
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Section 01400

LEVELING COURSE (D-1, RAP, ETC.)	MOISTURE DENSITY (PROCTOR)	1 PER SOIL TYPE AND NOTABLE CHANGE IN CHARACTERISTICS	PRIOR TO PLACEMENT	BEFORE USE ON PROJECT
	COMPACTION/DENSITY	FLATWORK = 1 PER LIFT & PER 5000 S.F.	IN PLACE	PRIOR TO NEXT LIFT
STRUCTURAL IN-SITU BASE OF EXCAVATION (BOTTOM OF HOLE)	GRADATION	1 PER IN-SITU STRUCTURAL BOTTOM OF HOLE AND NOTABLE CHANGE IN CHARACTERISTICS	PRIOR TO PLACEMENT	BEFORE BUILDING UPON
	MOISTURE DENSITY (PROCTOR)			
	COMPACTION/DENSITY	BASE OF EX. = 1 PER FOUNDATION AREA	IN PLACE	BEFORE BUILDING UPON
STRUCTURAL CONCRETE	SAMPLING	1 MINIMUM PER PLACEMENT, PER DAY (1-25 C.Y.), 1 EVERY 50 C.Y. THEREAFTER. 1 AFTER EACH ADDITION OF ADMIXTURE OR WATER (SLUMP AND AIR ONLY AFTER ADDING ONLY WATER)	POINT OF PLACEMENT (NOT @ TRUCK)	REPORT-24 HRS VERBAL-TIME OF TEST
	SLUMP			
	AIR CONTENT			
	TEMPERATURE			
	COMP. STRENGTH			7 & 28 DAYS
ARCHITECTURAL & CIVIL CONCRETE	SAMPLING	1 MINIMUM PER PLACEMENT, PER DAY (1-25 C.Y.), 1 EVERY 100 C.Y. THEREAFTER.	POINT OF PLACEMENT OR TRUCK CHUTE	REPORT-24 HRS VERBAL-TIME OF TEST
	SLUMP			
	AIR CONTENT			
	TEMPERATURE			
	COMP. STRENGTH			7 & 28 DAYS
STRUCTURAL GROUT (BASEPLATES, CMU, ETC.)	SAMPLING	1 PER PLACEMENT, PER DAY	BATCH POINT (ENSURE BATCH CONFORMS TO MFR SPECS)	REPORT-24 HRS VERBAL-TIME OF TEST
	SLUMP			
	AIR CONTENT			
	TEMPERATURE			
	COMP. STRENGTH			7 & 28 DAYS
AC PAVING	GRADATION	1 PER PLACEMENT, PER DAY AND EVERY 700 TONS THEREAFTER.	BEHIND PAVER & PRIOR TO COMPACTION	REPORT-24 HRS VERBAL-TIME OF TEST OR OBSERVATION
	CONTENT			
	COMPACTION/DENSITY	1 PER 5000 S.F.	AFTER FINAL ROLL	
	VISUAL	OBSERVE & DOCUMENT DEPTH, AGGREGATE SIZE, VOIDS IN AGGREGATE, OIL POOLING, ETC. VERIFY BATCH TICKET MIX DESIGN & PROJECT	DURING PLACEMENT	
<p>CONTRACTOR IS RESPONSIBLE FOR ALL COSTS INCURRED FOR RETESTS, REINSPECTIONS, REPLACEMENT OF NON-CONFORMING PRODUCTS. OWNER EMPLOYED SPECIAL INSPECTION VERIFICATION AND TESTING IS IN ADDITION TO THE CONTRACTOR'S QUALITY CONTROL TESTING. SPECIAL INSPECTION IN NO WAY DIMINISHES OR REDUCES THE CONTRACTOR'S QUALITY CONTROL OBLIGATIONS.</p>				

1.06 CONTROL

- A. Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least two phases of control shall be conducted by the CQC Manager for each definable feature of work as follows:
1. Preparatory Phase: This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved, and after copies are at the work site. This phase shall include:
 - a. A review of each paragraph of applicable specifications, reference codes, and standards. A copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by the Owner until final acceptance of the work.
 - b. A review of the contract drawings.
 - c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.
 - d. Review of provisions that have been made to provide required control inspection and testing.
 - e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
 - f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
 - g. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Documentation of construction tolerances and workmanship standards for that feature of work.
 - h. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Project Manager.
 - i. Discussion of the initial control phase.
 - j. The Owner shall be notified at least 48 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC Manager and attended by the Superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.
 2. Follow-up Phase: Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted, and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

1.07 TESTS

- A. Testing Procedure: The Contractor shall provide inspections, tests, and similar quality control services, specified in individual Specification Sections, and required by governing authorities, (Costs for these services shall be included in the Contract Sum). Upon request, the Contractor shall furnish to the Owner duplicate samples of test specimens for possible testing by the Owner. Testing includes operation and/or acceptance tests when specified. The Contractor shall perform the following activities and record and provide the following data:

1. Verify that testing procedures comply with contract requirements.
 2. Verify that facilities and testing equipment are available and comply with testing standards.
 3. Check test instrument calibration data against certified standards.
 4. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
 5. Results of all tests taken, both passing and failing, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Project Manager, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Project Manager. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.
- B. Retesting: The Contractor is responsible for retesting where results of required inspections, tests, or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.
- C. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests, and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:
1. Providing access to the Work, approved plans, and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
 2. Providing facilities for storage of all special inspection reports at the Project site and make available for review by the authorities having jurisdiction.
 3. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
 4. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.
 5. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
 6. Security and protection of samples and test equipment at the Project site.
- D. Correction of Work: The Contractor shall bear all costs of correcting all Work identified as defective or as failing to conform to the Contract Documents, including any additional Owner Inspection Costs, and additional compensation for the Architect's and/or Project Manager's additional services made necessary thereby.
- E. Qualification for Laboratory Agencies: Engage inspection and testing service agencies, including independent testing laboratories free of conflict on interests with the General Contractor, which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which specialize in the types of inspections and testing to be performed.
1. Each independent inspection and testing agency engaged on the Project shall be authorized by the authorities having jurisdiction to operate in the State of Alaska and the

- Municipality of Anchorage.
2. The Owner reserves the right to direct the specific location or area of work to be tested in accordance with contract requirements.

1.08 SPECIAL INSPECTIONS

- A. The Owner will provide Special Inspections, tests, and similar quality control services as identified in Section 01420, "Special Inspections". Costs for the Special Inspection services are not included in the Contract Sum.
- B. Duties of the Testing Agency: The independent testing agency engaged to perform inspections, sampling, and testing of materials and construction specified in individual Specification Sections shall cooperate with the Owner's Representative and Contractor in performance of its duties and shall provide qualified personnel to perform required inspections and tests.
 1. The agency shall notify the Project Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. The agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.
 3. Special Inspection agency shall not perform any duties of the Contractor, nor be under contract to perform testing services required of the Contractor.
- C. Coordination: The Contractor and each agency engaged to perform inspections, tests, and similar services shall coordinate the sequence of activities to accommodate required services. In addition, the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
 1. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.
 2. The Contractor shall notify the Owner's Special Inspectors, and the Owner, in writing 72 hours prior to required special inspection and coordinate with these inspectors so there are no additional project costs, schedule impacts or delays. The Contractor shall also be responsible to coordinate with the special inspectors and the Owner to identify on the construction schedule when these inspections shall occur.

1.09 WORKMANSHIP

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform work by persons qualified to produce workmanship of specified quality.
- C. Secure products in place in positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.10 MANUFACTURER'S INSTRUCTIONS

- A. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from the Project Manager before proceeding.

1.11 MANUFACTURER'S FIELD SERVICE

- A. When required by individual Specifications Section, submit manufacturer's certificate, signed by responsible officer of the Manufacturer, that products meet or exceed specified

requirements.

- B. When required by manufacturer, have manufacturer provide qualified representative to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance of equipment as applicable. Manufacturer Field Representative shall make a written report of observations and recommendations to the Project Manager.

1.12 SAMPLE PANELS AND MOCK-UPS

- A. Sample panels and/or mock-ups shall be used to establish uniform level of workmanship and finish color and texture. Accepted sample or mock-up shall serve as minimum standard of quality for subsequent work.
- B. Work on any Section requiring a sample panel or mock-up shall be approved in writing by the Owner.
- C. Sample panels or mock-ups may be requested by the Owner even though not specifically required of Specification Section to clarify level of workmanship, color, or texture.
- D. Tests shall be performed in accordance with Section 01410 and this section.

1.13 OBSERVATION

The following stages of construction specifically require observation by the Architect, Owner, and other Authorities having jurisdiction. Provide the indicated notice to the Project Manager prior to commencing work on the phase or upon completion as appropriate:

- A. Stages that require two day notice include:
 - 1. Completion of utility trench excavation prior to placement of bedding.
 - 2. Completion of utility pipe installation prior to backfill.
 - 3. Completion of subdrain system's drainage mat and perforated pipe prior to backfill.
 - 4. Completion of driveway, parking lot and sidewalk excavation, installation of geotextile fabric and backfill prior to placement of pavement.
 - 5. Completion of asphalt concrete pavement placement.
 - 6. Completion of portland cement concrete pavement placement.
 - 7. Completion of building excavation, geotextile fabric installation, and backfill prior to placement of concrete floor slab.
 - 8. Completion of excavation forming prior to concrete placement.
 - 9. Completion of concrete masonry, as damp-proofing work is beginning.
 - 10. Wall framing and sheathing completed, observation of shear wall fastening and connections.
 - 11. Mechanical and electrical rough-in and wall blocking, prior to cover.
 - 12. Insulation and vapor barrier installation prior to cover, observation required as work progresses, notify as phases are complete.
 - 13. Completion of mock-ups and finishes as mock-ups and areas are completed.
 - 14. Prior to beginning roofing.
- B. Stages that require five day notice include:
 - 1. Substantial Completion.
 - 2. Operational instructions.
 - 3. Final Completion.

1.14 COMPLETION INSPECTION

- A. Punch-Out Inspection: Near the end of the work, or any increment of the work established by a time stated in the specifications, the CQC Manager shall conduct an inspection of the work. A punch list of items which do not conform to the approved drawings and specifications shall be prepared and included in the CQC documentation, as required by Section 01400, paragraph 1.15 A.4. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Owner that the facility is ready for the Owner Substantial inspection.
- B. Final Inspection: The Contractor's Quality Control Inspection personnel shall be in attendance at the final inspection.

1.15 DOCUMENTATION

- A. The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:
 - 1. Contractor/Subcontractor and area of responsibility.
 - 2. Operating equipment with hours worked, idle, or down for repair.
 - 3. Work performed each day, giving location, description, and by whom.
 - 4. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified. List of deficiencies noted, along with corrective action.
 - 5. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawing requirements.
 - 6. Offsite surveillance activities, including actions taken.
 - 7. Instructions given/received and conflicts in plans and/or specifications.
 - 8. Any other remarks impacting quality control.
 - 9. Contractor's verification statement.
- B. These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Owner on a weekly basis within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. Reports shall be signed and dated by the CQC Manager. The report from the CQC Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

1.16 NOTIFICATION OF NONCOMPLIANCE

- A. The Project Manager will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Project Manager may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

TESTING LABORATORY SERVICES

PART 1. GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Contractor will employ and pay for the services of an independent testing laboratory, free of conflict of interests with the General Contractor, to perform specified testing.
- B. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the work of the contract.
- C. Inspection, sampling and testing required as called for in the following technical sections.
- D. The Contractor shall pay for re-inspections and re-testing required because of defective work or ill-timed notices.

1.02 RELATED REQUIREMENTS

- A. Article 7.7, Section 00700 - General Conditions.
- B. Inspections and testing required by laws, ordinances, rules, regulations, orders, project Contract Documents, or approvals of public authorities.
- C. Certification of Products: Respective Sections of Specifications.
- D. Test, Adjust, and Balance of Equipment: Respective Sections of Specifications.
- E. Each Specification Section Listed: Laboratory test required, and standards for testing.

1.03 QUALIFICATIONS OF LABORATORY

- A. Independent laboratory acceptable to Owner, Architect and Building Official.
- B. Meet "Recommended Requirements for Independent Laboratory Qualification" latest edition, published by American Council of Independent Laboratories, 1300 "I" Street N.W., Washington, D.C. 20005.
- C. Meet ASTM E-329 latest edition, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as used in Construction."

1.04 LABORATORY'S DUTIES

- A. Laboratory authorized to operate in Alaska, with a full-time engineer registered in Alaska on staff to review services.
- B. Ascertain and certify compliance with Contract Documents.
- C. Promptly submit, unless otherwise indicated, written Inspection and Test Report to each of the following within forty-eight hours of inspection:
 - 1. Owner: Two (2) copies
 - 2. Architect: Two (2) copies
 - 3. Contractor: Two (2) copies or as required

D. Include the following on Test Reports:

1. Date issued.
2. Project title and location.
3. Testing Laboratory name and address.
4. Inspector's name.
5. Date of inspection or sampling.
6. Record of temperature and weather.
7. Date of test.
8. Identification of product tested.
9. Test location in Project.
10. Type of inspection or test.
11. Observations regarding compliance with Contract Documents.

E. Laboratory is not authorized to:

1. Release, revoke, alter, or enlarge on Contract Document requirements.
2. Approve or accept any portion of work.
3. Assume any duties of Contractor.
4. Stop Work.

1.05 CONTRACTOR'S DUTIES

- A. Cooperate with laboratory personnel, provide access to work, and to Manufacturer's operations.
- B. Secure and deliver to the laboratory adequate quantities of representation samples of materials proposed to be used and which require testing.
- C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other materials mixes which require control by the testing laboratory.
- D. Furnish copies of products test reports as required.
- E. Furnish incidental labor and facilities:
 1. To provide access to work to be tested.
 2. To obtain and handle samples at the project site or at the source of the project to be tested.
 3. To facilitate inspections and tests.
 4. For storage and curing of test samples.
- F. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests. Twenty-four hour minimum notification.
 1. When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to Contractor's negligence.
- G. Notify Architect and Owner a minimum twenty-four hours in advance of any testing.
- H. Repair test holes to match original conditions.
- I. Quality Control is the responsibility of the General Contractor. The General Contractor should employ a testing firm to provide testing as required to monitor and maintain his own quality control program, as well as satisfy the specific requirements of the Contract Documents.

1.06 OWNER'S TESTING LABORATORY SERVICES

- A. The Owner may also employ and pay for the services of an Independent Testing Laboratory to perform specified testing as indicated in the Supplementary General Conditions and in this section. This testing service will be employed for Quality Assurance Only. QUALITY CONTROL IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
- B. The Contractor shall cooperate with the Owner's laboratory to facilitate the execution of its services.
- C. A copy of the Owner's laboratory written report of each test will be distributed to the Contractor.
- D. When initial tests indicate work does not comply with the Contract Document, all additional tests required, until tests pass, shall be at the expense of the Contractor.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

SPECIAL INSPECTIONS

PART 1. GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Purpose
- B. Types of Work
- C. Owner Responsibilities
- D. Engineer or Architect of Record Responsibilities
- E. Contractor Responsibilities
- F. Special Inspector Responsibilities

1.02 RELATED REQUIREMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division - 1 Specification Sections, apply to this Section.
 - 1. Section 00700 - General Conditions and Section 00800 – Supplemental Conditions of the Construction Contract.
 - 2. Section 01090 - Reference Specifications and Standards
 - 3. Section 01300 - Submittals
 - 4. Section 01400 - Quality Control Services

1.03 REFERENCES

- A. International Building Code (IBC) - SECTION 1704 - SPECIAL INSPECTIONS
- B. Uniform Administrative Code (UAC) - SECTION 306 - SPECIAL INSPECTIONS

1.04 PURPOSE OF SPECIAL INSPECTIONS

- A. In accordance with IBC Section 1704.1 General "In addition to the inspections required by Section 109, the owner or the engineer or architect of record acting as the Owner's agent shall employ one or more special inspectors who shall provide inspections during construction on the types of work listed under 1704."

1.05 TYPES OF WORK

- A. Except as provided in IBC Section 1704, the types of work listed below shall be inspected by a Special Inspector.
 - 1. Concrete.
 - 2. Bolts installed in concrete.
 - 3. Reinforcing steel in concrete.
 - 4. Structural welding.
 - 5. High-strength bolting.
 - 6. Structural masonry.
 - 7. Spray-applied fireproofing.
 - 8. Special grading, excavation, and filling.

- B. Continuous and Periodic Special Inspection and Approved Fabricators shall be a part of the Special Inspection requirements.

1.06 OWNER RESPONSIBILITIES

- A. The Owner or the Engineer or Architect of Record acting as the Owner's agent shall employ one or more Special Inspectors who shall provide inspections during construction on the types of work listed.
- B. The Owner shall be responsible for providing a full set of drawings and specifications to each Special Inspector.

1.07 ENGINEER OR ARCHITECT OF RECORD

- A. The Engineer or Architect of Record, under the Owner's direction, may be required to employ one or more Special Inspectors who shall provide inspections during construction on the types of work listed under IBC Section 1704.
- B. The Engineer or Architect of Record, under the Owner's direction, may be responsible for coordinating the Pre-Construction Meeting, with the Contractor, to include Special Inspectors for the purpose of reviewing the Special Inspection Program and responsibilities of each member.
- C. The Engineer or Architect of Record is responsible for clearly indicating the design parameters and material selection on the project plans and/or specifications.
- D. The Engineer or Architect of Record shall determine when and where Special Inspection is necessary in order to meet requirements of the Code.
- E. It shall be the responsibility of the Architect or Engineer of Record to prepare a typewritten Special Inspection Program for submittal to the Building Official for review and approval (UAC 302.5). Such approval shall be obtained prior to issuance of a Building Permit.
- F. Design changes required to correct non-conforming work already incorporated into the completed construction, shall be identified to the Building Official for review and approval as a Change Order. Such Changes shall be generated by the Engineer or Architect of Record.

1.08 CONTRACTOR RESPONSIBILITIES

- A. The Contractor shall be responsible for calling a Pre-Construction meeting to review Special Inspection requirements as they pertain to the project. Attendees shall include the Contractor's Construction Supervisor, ASD Project Manager, the Engineer or Architect of Record, the Building Safety Division Inspector assigned to the project, all Special Inspectors, and any subcontractors who will actually be constructing items requiring Special Inspection. This meeting shall not be considered a substitute for any pre-construction meeting held between the Contractor and the Owner and Engineer or Architect of Record although they may coincide.
- B. The Contractor shall be responsible for notifying the Special Inspector or special inspection firm regarding required special inspections. Notice shall be a minimum of 24 hours in advance.
- C. The Contractor shall have on site at all times, an approved set of plans and construction documents available to the Special Inspector for the purpose of reference or clarification.

- D. The Contractor shall be responsible for retaining, on site, a copy of all Special Inspection records submitted by the Special Inspector.

1.09 SPECIAL INSPECTOR RESPONSIBILITIES

- A. The Special Inspector shall observe the work assigned for conformance with the approved design drawings and specifications.
- B. Special Inspectors requiring certification by an agency such as ICBO, ACI, or AWS shall carry current certification with them while performing the Work on site.
- C. The Special Inspector shall remain on site at all times when work requiring Special Inspection is in progress.
- D. The Special Inspector shall immediately bring all nonconforming items of work or material to the immediate attention of the Contractor for correction.
- E. The Special Inspector or Inspection Firm shall submit required written reports to the Building Official (two copies), the Owner, and the Engineer or Architect of Record within 48 hours of inspection.
- F. Special Inspectors or Inspection Firms shall submit a final signed report to the Building Safety Division stating that all items requiring Special Inspection were, to the best of their knowledge, in conformance with the approved design drawings, specifications, approved change orders and the applicable workmanship provided in the International Building Code. Items not in conformance, unresolved items, and any discrepancies in inspection coverage shall be specifically itemized in the final report.
- G. Special Inspectors shall meet all certification requirements stated in the Special Inspection Program and required by the Municipality of Anchorage Building Safety Division and shall maintain certification at all times throughout the project.

END OF SECTION

STRUCTURAL OBSERVATION

PART 1. GENERAL

1.01 REQUIREMENT INCLUDED

- A. Purpose
- B. Types of Work
- C. Owner Responsibilities
- D. Engineer or Architect of Record Responsibilities
- E. Contractor Responsibilities
- F. Structural Observer Responsibilities

1.02 REFERENCES

- A. International Building Code (IBC)–Section 1709 STRUCTURAL OBSERVATION.

1.03 PURPOSE OF STRUCTURAL OBSERVATION

- A. In accordance with IBC Section 1709, the purpose of Structural Observation is as defined in IBC Section 1702.1: Visual observation of the structural system, for general conformance to the approved plans and specifications, at significant construction stages and at completion of structural system. Structural Observation does not include or waive the responsibility for the inspections required by other sections of the IBC.

1.04 TYPES OF WORK

- A. The Design Structural Engineer or another engineer designated by the Design Structural engineer shall perform Structural Observation.
- B. Observed deficiencies shall be reported in writing to the Owner's Representative, Special Inspector, Contractor, and the Building Official.
- C. The Structural Observer shall submit to the Building Official a written statement that the site visits have been made and identifying any reported deficiencies that, to the best of the Structural Observer's knowledge, have not been resolved.

1.05 OWNER'S RESPONSIBILITIES

- A. The Owner or the Engineer or Architect of Record acting as the Owner's Agent shall employ one or more Structural Observers who shall provide structural observation during construction on the types of work identified under IBC Section 1709.

1.06 ENGINEER OR ARCHITECT OF RECORD

- A. The Engineer or Architect of Record, under the Owner's direction, may be required to employ one or more Structural Observers who shall provide inspections during construction on the types of work defined under IBC Section 1709.

- B. The Engineer or Architect of Record, under the Owner's direction, with the Structural Observer, will review with the Contractor the Structural Observer Program and responsibilities of each member.
- C. The Engineer or Architect of Record is responsible for clearly indicating the design parameters and material selection on the project plans and/or specifications.
- D. The Engineer or Architect of Record shall determine when and where Structural Observation is necessary in order to meet requirements of the Code.
- E. Design changes required to correct non-conforming work already incorporated into the completed construction, shall be identified to the Building Official for review and formal approval. Such changes shall be generated by the Engineer or Architect of Record.

1.07 CONTRACTOR RESPONSIBILITIES

- A. The Contractor shall be responsible for calling a Structural Observation Organizational meeting to review the Structural Observation requirements as they pertain to the project. Attendees shall include the Contractor's Construction Supervisor, ASD Project Manager, the Engineer or Architect of Record, the Building Safety Division Inspector assigned to the project, all Structural Observers, and any subcontractors who will actually be constructing items requiring Structural Observation. This meeting shall not be considered a substitute for any pre-construction meeting held between the Contractor and the Owner and Engineer or Architect of Record although they may coincide.
- B. The Contractor shall have on site at all times, an approved set of plans and construction documents available to the Structural Observer for the purpose of reference or clarification.
- C. The Contractor shall be responsible for retaining, on site, a copy of all Structural Observation records submitted by the Structural Observer.

1.08 STRUCTURAL OBSERVER RESPONSIBILITIES

- A. The Structural Observer shall observe the work assigned for conformance with the approved design drawings and specifications.
- B. The Structural Observer shall remain on site at all times when work requiring Structural Observation is in progress.
- C. The Structural Observer shall immediately bring all nonconforming items of work or material to the immediate attention of the Contractor for correction.
- D. The Structural Observer shall submit required written reports to the Building Official (two copies), the Owner, and the Engineer or Architect of Record within 48 hours of inspection.
- E. The Structural Observers shall submit a final signed report to the Building Safety Division stating that all items requiring Structural Observation were, to the best of their knowledge, in conformance with the approved design drawings, specifications, approved change orders and the applicable workmanship provided in the International Building Code. Items not in conformance, unresolved items, and any discrepancies in inspection coverage shall be specifically itemized in the final report.

END OF SECTION

TEMPORARY FACILITIES AND CONTROLS

PART 1. GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

- A. Definitions: Specific administrative and procedural minimum actions are specified in this section as extensions of provision in General Conditions and other Contract Documents. These requirements have been included for special purposes as indicated. Nothing in this section is intended to limit types and amounts of temporary work required, and no omission from this section will be recognized as an indication that such temporary activity is not required for successful completion of the work and compliance with requirements of Contract Documents. Provisions of this section are applicable to, but not by way of limitation, utility services, construction facilities, support facilities, and security-protection provisions.

1.02 QUALITY ASSURANCE

- A. In addition to compliance with governing regulations and rules/recommendations of utility companies, comply with specific requirements indicated and with applicable local codes and industry standards for construction work.

1.03 JOB CONDITIONS

- A. General: Establish and initiate use of each temporary facility at time first reasonably required for proper performance of the work. Terminate use and remove facilities at earliest reasonable time, when no longer needed or when permanent facilities have, with authorized use, replaced the need.
- B. Conditions of Use: Install, operate, maintain, and protect temporary facilities in a manner and at locations which will be safe, non-hazardous, sanitary, and protective of persons and property, and free of deleterious effects.
- C. Pay all costs for such general services and temporary facilities, except as otherwise specified, until final acceptance of the work and/or Owner's beneficial occupancy of completed portions of the work.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Materials may be new or used but must be suitable and adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.
- B. A new electrical utility drop and new transformer will be installed by local electric utility and is not a part of the scope of work. Permanent electrical service and distribution from the new transformer is required and made a part of Scope of Work to be complete for Substantial Completion.

PART 3. EXECUTION

3.01 TEMPORARY FACILITIES

A. Field Offices

1. Provide and maintain Contractors field office at the job site.
 - a. Construction shanties, sheds, and temporary facilities provided as required above shall be maintained in good condition and neat appearance.

B. Staging Area

1. All Contractor's storage, staging, field fabrication and field office operations shall be confined to the staging area shown on drawings.
2. Staging area shall be kept clean and orderly.

C. Sanitary Facilities

1. Provide and maintain temporary sanitary toilets in number required, location directed, and types approved by the regulatory authorities.

D. Electricity

1. Make all arrangements and pay for temporary electrical service to the construction area. Provide all equipment necessary for temporary power and lighting, and pay all charges for this equipment, and the installation thereof. Verify that electrical service is of adequate capacity for all construction tools and equipment without overloading the facilities.
2. Provide power distribution as required throughout for construction operations of all trades. The termination of power distribution shall be at convenient locations in the building. Terminations shall be provided for each voltage supply complete with circuit breakers, disconnect switches, and other electrical devices as required to protect the power supply system.
3. A temporary lighting system shall be furnished, installed and maintained as required to satisfy minimum requirements of safety and security. The temporary lighting system shall afford general illumination in all building areas and shall supply no less than 1-watt per square foot of floor area for illumination in the areas of the building where work is being performed.
4. All temporary equipment and wiring for power and lighting shall be in accordance with the applicable provisions of the governing codes. All temporary wiring shall be maintained in a safe manner and utilized so as not to constitute a hazard to persons or property.
5. When permanent electrical power and lighting systems are in operating condition they may be used for temporary power and lighting for construction purposes, provided that Contractor assumes full responsibility for the entire power and lighting systems and pays for power consumption until final acceptance or beneficial occupancy, whichever is first.
6. At the completion of the construction work all temporary wiring, lighting and other temporary electrical equipment devices shall be removed.

- E. Heating, Cooling and Ventilation: Furnish by approved methods, temporary heat including fuel and power as required to protect materials and work from dampness and cold and to dry out the facility. New permanent heating system may be used for this purpose; however, such use shall not relieve Contractor of Guarantee responsibilities. Refer to individual sections for temperatures to be maintained for the work of the various trades. If the

permanent heating is used for temporary heat, ducts shall be completely cleaned of dust and dirt and all filters replaced if "throw-away" type or cleaned if permanent type prior to occupancy.

F. Water Service

1. Provide all water necessary for construction purposes.
2. Furnish drinking water with suitable containers and cups for use of employees. Drinking water dispensers shall be conveniently located in the building where work is in progress.

3.02 TEMPORARY CONTROLS

A. Access Provisions

1. Provide ramps, stairs, ladders, and similar temporary access elements as reasonably required to perform the work and facilitate its inspection during installation. Comply with reasonable requests of governing authorities performing inspections.

B. Environmental Control

1. Provide and maintain all fences, barricades, lights, shoring and other protective structures or devices necessary for the safety of workmen, equipment, the public and property as required by state or municipal laws and regulations, and local ordinances, laws and other requirements of the municipality, state, and other authorities having jurisdiction with regard to safety precautions, dust control, and fire hazards.

C. Security and Protection Provisions.

1. The types of temporary security and protection provisions required include, but not by way of limitation, fire protection, personnel security program (theft prevention), and similar provisions intended to minimize property losses, personal injuries, and claims for damages at project site throughout construction period.
2. Building Enclosure and Lock-up: At earliest possible date secure building against unauthorized entrance at times when personnel are not working. Provide secure temporary enclosures at ground floor and other locations of possible entry, with locked entrances.
3. Fire Extinguishers: Provide types, sizes, numbers, and locations as would be reasonably effective in extinguishing fires during early stages by personnel at project site. Provide Type ABC dry chemical extinguishers; comply with recommendations of NFPA 10. Post warning and instructions at each extinguisher location, and instruct all personnel at project site, at time of their first arrival, on proper use of extinguishers and other available facilities at project site. Post local fire department call number on each telephone at project site.
4. Before beginning any work that may result in a fire alarm transmission, the contractor shall call both the Anchorage Fire Department dispatcher at 522-1122 and the local fire station which would respond to an alarm and let them know you will be working on the system and for approximately how long. Second, the contractor shall call Guardian Security at 274-5275 and notify the dispatcher that you have called the Fire Department, what type of work you are planning to do, and approximately how long before you expect to be completed. After the contractor is completed with your work, you must reverse the process by notifying the Fire Department dispatcher and the ASD Dispatcher that you are finished.

D. Traffic

1. Conduct operations and the removal of debris to ensure minimum interference with adjacent occupied facilities.
2. Do not close or obstruct other occupied facilities without required permission. Provide alternate and safe routes around closed or obstructed traffic ways if required.
3. Whenever Contractor's operations affect public vehicular or pedestrian traffic, Contractor shall be responsible for installation and maintenance of any and all traffic control devices as seemed necessary by authority having jurisdiction.
4. Reference also Section 01502, "Maintenance of Traffic", for additional information and requirements.

3.03 TEMPORARY EQUIPMENT

A. Thermometer:

1. Maintain one twelve inch minimum size high/low register outdoor thermometer. Mount at convenient location not in direct sunlight. Contractor to record daily high and low temperatures.
2. Thermometer Range - Minus 60 to plus 110 F.

B. Protective Headgear:

1. Provide for visitor's use six (6) new adjustable OSHA-approved hard hats.

3.04 REMOVAL

- A. Maintain all temporary facilities and controls as long as needed for safe and proper completion of Work. Remove all such temporary facilities and controls as rapidly as progress of the Work will permit, or as directed by Project Manager. Clean and repair damage caused by temporary installations or use of temporary facilities. Restore existing facilities used for temporary services to specified or original condition.

END OF SECTION

PROJECT SIGN

PART 1. GENERAL

1.01 DESCRIPTION OF WORK

- A. Furnish, install, and maintain project identification sign.
- B. Project sign must be approved and permitted, prior to erections. Allow no other signs to be displayed.

1.02 PROJECT IDENTIFICATION

- A. Painted sign of 32 sf. area with painted graphic, or printed vinyl sign, content to include:
 - 1. Title of project
 - 2. Name of Owner.
 - 3. Names of professional consultants
 - 4. Prime contractor.
 - 5. Major subcontractors.
 - 6. An area 18" square for Owner logo.
- B. Graphic design, style of lettering, and colors: As shown in this section.
- C. Erect on the site at a lighted location of high public visibility as approved by Project Manager.

1.03 QUALITY ASSURANCE

- A. Sign Painter: Professional experience in type of work required.
- B. Finishes, Painting: Adequate to resist weathering and fading during scheduled construction period.

PART 2. PRODUCTS

2.01 SIGN MATERIALS

- A. Structure and Framing: may be new or used, wood or metal, in sound condition structurally adequate to work and suitable for specified finish.
- B. Sign Surfaces: Exterior softwood plywood with medium density overlay, standard large sizes to minimize joints. Thickness as required by standards to span framing members, to provide even, smooth surface without waves or buckles.
- C. Rough Hardware: Galvanized.
- D. Paint: Exterior quality semi-gloss Alkyd, as specified in painting specification.
- E. Vinyl Lettering and Graphics may be considered upon submittal to Project Manager.

PART 3. EXECUTION

3.01 PROJECT SIGN

- A. Paint exposed surfaces of supports, framing, and surface material; one coat of primer and one coat of exterior paint.
- B. Paint graphics in styles, sizes and colors selected.

3.02 MAINTENANCE

- A. Maintain sign and supports in a neat, clean condition; repair damages to structure, framing or sign.

3.03 REMOVAL

- A. Remove sign, framing, supports, and foundations at completion of the project.



END OF SECTION

MATERIALS AND EQUIPMENT

PART 1. GENERAL

1.01 DESCRIPTION

- A. Materials and Equipment incorporated into Work shall:
 - 1. Conform to applicable specifications and standards.
 - 2. Comply with size, make, type, and quantity specified, unless otherwise approved in writing.
- B. Manufactured and Fabricated Products:
 - 1. Manufacture like parts of duplicate units to standard size and gauges, and to be interchangeable.
 - 2. Two or more items of same kind shall be identical, and by same Manufacturer.
 - 3. Products shall be suitable for service conditions.
 - 4. Equipment shall comply with capacity, sizes, and dimensions shown or specified, unless otherwise approved in writing.
- C. Do not use materials or equipment for any purpose other than that for which designed or specified.

1.02 RELATED REQUIREMENTS

- A. Section 01010: Summary of Work
- B. Section 01340: Shop Drawing, Product Data and Samples.
- C. Section 01630: Substitution and Product Option
- D. Section 01710: Cleaning

1.03 CONTRACTOR'S OPTIONS

- A. For products specified only by reference standard, select any product meeting standard.
- B. For products specified by naming several products, select any of such products.
- C. For products specified by naming one or more products and "or approved", select any one specified product or submit request for substitution as specified.

1.04 INAPPROPRIATE PRODUCTS AND METHODS

- A. If Contractor believes that any specified product, method, or system is inappropriate for use, he shall, if possible, so notify the Project Manager at least ten (10) working days prior to bid opening, and if not possible, such notice shall be given before performing work in question. If notice of objection is not received within the specified time limits, it will be assumed that Contractor agrees that specified products, methods, and systems are not inappropriate for use.
- B. No asbestos containing materials are to be incorporated into the project. Certification signed by the General Contractor shall state that Asbestos Containing materials have not been installed under this project. Turn certification in to Project Manager no later than first payment application submittal. Recertify to Owner at substantial completion inspection.

1.05 PRODUCT SUBSTITUTIONS

- A. Refer to Section 01630.

1.06 NUMBER OF PRODUCTS REQUIRED

- A. Whenever in specifications a product is referred to in singular number, such reference shall include as many such products as are shown on Drawings are required to complete the Work.

1.07 PRODUCTS LIST

- A. Submit to Project Manager complete list of major products proposed for use; Specification Section, include proprietary product name, manufacturer's name, and installing Subcontractor's name in accordance with requirement of Section 01340 Shop Drawing, Product Data and Samples.

1.08 MANUFACTURER'S INSTRUCTIONS

- A. Perform work in accordance with Manufacturer's instructions.
- B. Do not omit preparatory or installation procedures required by Manufacturer, unless specifically modified by Contractor Documents.
- C. When Contract Documents require Work to comply with Manufacturer's instruction, obtain and distribute such instructions to parties performing work, including copies to Architect and Project Manager. Maintain one set at job site during installation and until acceptance.
- D. Handle, install, connect, clean, condition, and adjust products in strict accord with such instructions and in conformance with specified requirements.
- E. Should job conditions or specified requirements conflict with Manufacturer's instructions, consult Project Manager for further instructions.
- F. Do not proceed with work without clear instructions.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

DELIVERY, STORAGE, AND HANDLING

PART 1. GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide for expeditious transportation and delivery of products to project site undamaged, on schedule to avoid delay of the Work.
- B. Providing equipment and personnel at site to unload and handle products in manner to avoid damage to products.
- C. Provide secure storage and protection for products to be incorporated into the Work, and maintenance and protection for products after installation and until completion of the Work.

1.02 DELIVERY

- A. Arrange deliveries of products in accord with construction schedules and in ample time to facilitate inspection prior to installation.
- B. Coordinate deliveries to avoid conflict with work and conditions at site. Contractor deliveries must not conflict with:
 - 1. Work of other Contractors, or Owner.
 - 2. Limitations of storage space.
 - 3. Availability of equipment and personnel for handling products.
 - 4. Owner's use of premises.
- C. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible.
- D. Partial deliveries of component parts of equipment shall be clearly marked to identify equipment, to permit easy accumulation of parts and to facilitate assembly.
- E. Immediately upon delivery, inspect shipment to assure:
 - 1. Product complies with requirements of contract documents and reviewed submittals.
 - 2. Quantities are correct.
 - 3. Containers and packages are intact, labels are legible.
 - 4. Products are protected and undamaged. Minor damages may be repaired, provided finish items are equivalent in all respects to new work.

1.03 PRODUCT HANDLING

- A. Provide equipment and personnel necessary to handle products, including those provided by Owner, by methods to prevent soiling or damage to products or packaging.
- B. Provide additional protection during handling as necessary to prevent scraping, marring, or otherwise damaging products or surrounding surfaces.
- C. Handle products by methods to prevent bending or over-stressing.
- D. Lift heavy components only at designated lifting points.

1.04 STORAGE

- A. Store products immediately on delivery and protect until installed in the Work. Store in accord with manufacturer's instructions, with seals and labels intact and legible.
- B. Store products subject to damage by elements in substantial weather-tight enclosures.
 - 1. Maintain temperatures with ranges required by manufacturer's instructions.
 - 2. Provide humidity control for sensitive products, as required by manufacturer's instructions.
 - 3. Store unpacked products on shelves, in bins, or in neat piles, accessible for inspection.
- C. Exterior Storage
 - 1. Provide substantial platforms, blocking, or skids to support fabricated products 4" above ground, prevent soiling or staining.
 - 2. Cover products, subject to discoloration or deterioration from exposure to elements, with impervious sheet coverings. Avoid use of non-vented plastic or canvas shelters which could create humidity chambers. Provide adequate ventilation to avoid condensation.
 - 3. Store loose granular materials in solid surfaces such as paved areas or provide plywood or sheet materials to prevent mixing with foreign matter.
 - a. Provide surface drainage to prevent flow or ponding of rainwater.
 - b. Prevent mixing of refuse or chemically injurious materials or liquids.
 - 4. Provide exterior storage area within Contractor Secure area.
- D. Arrange storage in manner to provide easy access for inspection.

1.05 MAINTENANCE OF STORAGE

- A. Maintain periodic system of inspection of stored products on scheduled basis to assure that:
 - 1. State of storage facilities is adequate to provide required conditions.
 - 2. Required environmental conditions are maintained on continuing basis.
 - 3. Surfaces of products exposed to elements are not adversely affected. Any weathering of products, coatings, and finishes is not acceptable under requirements of contract documents.
- B. Mechanical and electrical equipment which requires servicing during long-term storage shall have complete manufacturer's instructions for servicing accompanying each item, with notice of enclosed instructions shown on exterior of package.

1.06 PROTECTION AFTER INSTALLATION

- A. Provide protection of installed products to prevent damage from subsequent operations, usage or vandalism. Remove when no longer needed, prior to completion of work.
- B. Control traffic to prevent damage to equipment and surfaces.
- C. Provide coverings to protect finished surfaces from damage.
 - 1. Cover projections, wall corners, jambs, sills, and soffits of openings, in areas used for traffic and for passage of products in subsequent work.
 - 2. Protect finished floors and stairs from dirt and damage.
 - a. In areas subject to foot traffic, secure heavy paper, sheet goods, and other

materials in place.

- b. For movement of heavy products, lay planking or similar materials in place.
- c. For storage of product, lay tight wood sheathing in place.

D. Waterproofed and Roofing Surfaces

- 1. Prohibit use of surface for traffic and any kind, or for storage of any products.
- 2. When some activity must take place in order to carry out Contract, obtain recommendations from installer for protection of surface.
 - a. Install recommended protection, remove on completion of that activity.
 - b. Restrict use of adjacent unprotected areas.

1.07 DAMAGED PRODUCTS

- A. Remove damaged or deteriorated materials from the premises. Replace materials which have been damaged.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

SUBSTITUTION AND PRODUCT OPTION

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 DESCRIPTION OF WORK

- A. Contractor's options in selection of products.
- B. Requests for substitution of products.

1.03 RELATED REQUIREMENTS

- A. Section 00100 - Instruction to Bidders.
- B. Section 00700 and 00800 - General Conditions and Supplementary General Conditions.
- C. Section 01340 - Shop Drawings, Product Data and Samples.

1.04 CONTRACTOR'S OPTIONS

- A. Reference to any equipment, material, article, or patented process by trade name, make or catalog number shall be regarded as establishing a standard of quality and characteristics of products that will be satisfactory and shall not be construed as limiting competition.
- B. Whether or not specifically named equipment or material is followed by the term "equivalent" or "equivalent product" or "approved equal", it shall not exclude other manufacturer's equipment or materials from consideration, unless "NO SUBSTITUTIONS" called out in the specification sections. In this usage, the terms "equivalent" and "equal" or "approved equal" are interchangeable though a product or method considered for substitution may be equivalent to a specified product or method without actually being equal, by virtue of performance, appearance, and meeting specified or implied criteria.
- C. No item will be considered for substitution prior to the bid opening. Consequently, the Bidder shall make its own determination if a substituted item will be equivalent to or better than that specified or indicated in regard to quality, workmanship, finish, space requirements, electrical requirements, performance and guarantees or warranties. Any change in bid and/or contract amount due to any subsequent rejection of product found "not equivalent" will not be considered.
- D. After the Notice to Proceed the Contractor shall submit sufficient data in accordance with this Section to establish equality. The Owner's Representative shall be the sole judge of equality and acceptability.
- E. Acceptance of substitute materials will not relieve the Contractor of the responsibility for any changes in the Contractor's own work or in the work of other trades caused by the substitution. Any additional costs resulting from substitutions are the responsibility of the Contractor.

1.05 SUBSTITUTION PROCEDURE

- A. Requests for substitutions of products will be considered only within 90 calendar days after Notice to Proceed. Subsequent requests will be considered only when judged to be in the best interest of the Owner.
- B. Substitutions will not be considered when indicated on shop drawings or product data submittals without separate formal request, when requested directly by subcontractor or

supplier, or when acceptance will require substantial revision of Contract Documents.

- C. Substitute products shall not be ordered or delivered without written acceptance.
- D. Submit separate request for each substitution. Document each request with complete data substantiating compliance of proposed substitution with requirements of Contract Documents.
- E. Identify products by specifications section and article numbers. Provide manufacturer's name and address, trade name of product, and model or catalog number. List fabricators and suppliers as appropriate.
- F. Attach product data as specified in Section 01340 and the following:
 - 1. Give itemized comparison of proposed substitution with specified product and listing variations.
 - 2. Give quality and performance comparison between proposed substitution and specified product.
 - 3. List availability of maintenance services and replacement materials.
 - 4. State effect of substitution on construction schedule, and changes required in other work or products.
- G. If no requests for substitutions have been received within time frame stated above, it will be assumed that construction will proceed with equipment, materials and products called for in Contract Documents.

If this is subsequently found not to be the case, the Owner reserves the right to demand that unapproved item be removed and replaced with specified item.

1.06 CONTRACTOR REPRESENTATION

- A. Request for substitution constitutes a representation that Contractor has investigated proposed product and has determined that it is equal to or superior in all respects to specified product.
- B. Contractor shall provide same warranty or bonds for substitution as for specified product.
- C. Contractor shall coordinate installation of accepted substitute, making such changes as may be required for work to be complete in all respects, specifically including any related redesign costs.
- D. Contractor waives claims for additional cost caused by substitution which may subsequently become apparent.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

(Except for "Substitution Request Form," 1 page)

SUBSTITUTION REQUEST FORM

TO: _____

PROJECT: _____

We hereby submit for your consideration the following product instead of the specified item for the above project:

Section _____ Page _____ Paragraph _____ Specified Item _____

Proposed Substitution: _____

Attach complete Product description, drawings, photographs, performance and test data, and other information necessary for evaluation.

Will changes be required to building design in order to properly install proposed substitution?
Yes ___ No ___ If Yes, explain: (Add second sheet).

Will the undersigned pay for changes to the building design, including engineering and drawing costs, caused by requested substitution? Yes ___ No ___.

What differences exist between proposed substitution and specified item?

Does substitution affect Drawing dimension? Yes ___ No ___ If Yes, explain: (Add second sheet.)

What affect does substitution have on other trades?

Does Manufacturer's warranty of proposed substitution differ from that specified?
Yes ___ No ___ If Yes, explain: (Add second sheet.)

Will substitution affect Progress Schedule? Yes ___ No ___ If Yes, explain: (Add second sheet.)

Will substitution cost more than specified Product? Yes ___ No ___ If Yes, explain: (Add second sheet.)

Do substitutions affect the Commissioning process and checklists included in Division 17? Yes ___ No ___ If any, attach a marked-up copy of the appropriate Checklist(s) from Division 17 for Owner's approval.

Will maintenance and service parts be locally available for substitution? Yes ___ No ___ If Yes, explain: (Add second sheet.)

Submitted by:
Signature: _____
Firm: _____
Address: _____
City: _____
Date: _____

For Owner's Representative's Use Only:
Accepted () Accepted as Noted ()
Not Accepted () Received Too Late ()
By: _____
Date: _____
Remarks: _____
Phone: _____

STARTING OF SYSTEMS

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SECTION INCLUDES

- A. Starting systems.
- B. Demonstration and instructions.
- C. Testing, adjusting, and balancing.

1.03 RELATED SECTIONS

- A. Section 01730 - Operation and Maintenance Data.

1.04 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Owner seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or for other conditions which may cause damage.
- D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable manufacturer's representative in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

1.05 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. In a classroom environment located at the Project site, demonstrate, and provide instruction for the Project equipment by a manufacturer's representative who is knowledgeable about the Project.
- C. For equipment or systems requiring seasonal operation, perform demonstration for other season within nine months.
- D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual

with Owner's personnel in detail to explain all aspects of operation and maintenance.

- E. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at equipment location.
- F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- G. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

1.06 TESTING, ADJUSTING, AND BALANCING

- A. The independent firm will perform services specified in Section 01410.
- B. Reports will be submitted by the independent firm to the Owner indicating observations and results of tests and indicating compliance or non-compliance with the requirements of the Contract Documents.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

PROJECT CLOSE-OUT

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. Definitions: Close-out is hereby defined to include general requirements near the end of contract time, in preparation for final acceptance, final payment, normal termination of contract, occupancy by Owner and similar actions evidencing completion of the work. Specific requirements for individual units of work are specified in sections of Division 2 through 16. Time of Close-out is directly related to "Substantial Completion".

1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. General and Supplementary General Conditions
- B. Section 01750: Warranty of Work after Final Payment
- C. Section 01750: Certificate of Compliance

1.03 SUBSTANTIAL COMPLETION

- A. When Contractor considers work substantially complete as defined in contract conditions, he shall submit to the Project Manager:
 - 1. Written notice that work, or designated portion thereof, is substantially complete.
 - 2. List of items to be completed or corrected.
 - 3. Conditional Certificate of Occupancy from governing authorities.
 - 4. Project Records and Contract Record Drawings.
- B. Project Manager will at the mutually agreed time, make inspection to determine completion status.
 - 1. Should Project Manager determine that work is not substantially complete:
 - a. Project Manager will promptly notify Contractor, in writing, giving reasons therefore.
 - b. Contractor will remedy work deficiencies, and send second notice of substantial completion to Project Manager.
 - c. Project Manager will re-inspect work, with his cost and/or expense for such to be the Contractor's responsibility.
 - 2. When Project Manager concurs that work is substantially complete, the Architect will:
 - a. Prepare Certificate of Substantial Completion accompanied with Contractor's list of items to be completed or corrected, as verified and amended by the Project Manager and Architect.
 - b. Submit certificate to Owner and Contractor for their written acceptance of the responsibilities assigned to them in the certificate.

1.04 FINAL INSPECTION

- A. When Contractor considers work complete, he shall submit written certification that:
 - 1. Contract documents have been reviewed.
 - 2. Contractor has inspected work for compliance with contract documents.
 - 3. Work has been completed in accordance with contract documents.

4. Equipment and systems have been tested and operated in presence of Owner's representative and are operational.
 5. Copy of substantial completion punch lists stating that each item has been completed or otherwise resolved for acceptance.
- B. Project Manager will, at the mutually agreed time, inspect the work to verify completion status.
1. Should the Project Manager consider work incomplete or defective:
 - a. Project Manager will promptly notify Contractor in writing of any incomplete or defective work.
 - b. Contractor shall immediately remedy deficiencies, and send written certification to Project Manager that work is complete.
 - c. Project Manager will re-inspect work.
 2. When Project Manager finds the work acceptable under contract documents, he will request Contractor to make closeout submittals.

1.05 RE-INSPECTION FEES

- A. Should Project Manager and or Engineer be required to make more than one substantial and/or final inspection due to Contractor's failure to correct specified deficiencies, the Contractor shall bear all costs made necessary by such additional inspections.

1.06 SUBMITTALS

A. Record Drawings

1. Prior to Final Completion of the Project, the Contractor and/or Subcontractors under his direction, shall submit records of changes on prints to Project Manager.
2. Accompany submittal with transmittal letter, to Project Manager, containing:
 - a. Date
 - b. Project title and number
 - c. Contractor's name and address
 - d. Title and number of each record document
 - e. Certification that each document as submitted is complete and accurate.
 - f. Signature of Contractor, or his authorized representative.
3. Provide drawings and special system drawings on CD in AutoCad format.

B. Project Record Documents

C. Operating and Maintenance Data

D. Building Official's Certificate of Occupancy (MUST BE RECEIVED IN TIME TO ALLOW OCCUPANCY ON DATE REQUIRED IN CONTRACT DOCUMENTS).

E. Warranty of Work after Final Payment Section 01750

F. Certificate of Compliance Section 01750

G. AHERA Exclusion document Section 01750

H. Department of Revenue Tax Clearance Section 01750

- I. Department of Labor Tax Clearance Section 01750
- J. Department of Labor Notice of Completion of Public Works Section 01750
- K. Certificate of Domestic water disinfection.
- L. Evidence of Payments and Release of Liens
 - 1. Contractor's Affidavit of Payment of Debt and Claims.
 - 2. Contractor's Affidavit of Release of Liens including the following:
 - a. Consent of Contractor's Surety to Final Payment.
 - b. Contractor's Release of Waiver of Liens.
 - c. Separate releases of Waivers of Lien for each subcontractor, supplier, and others with lien rights against Owner's property.
- M. Storm Water Pollution Prevention Plan (SWPPP) and associated documents.
 - 1. A copy of the Notice of Intent (NOI) and the plan review location notice shall be posted in the project office on site.
 - 2. A copy of the SWPPP shall be retained in the project office during construction.
 - 3. All records relating to the SWPPP, as well as the Plan, the NOI, and NOT shall be retained by the Contractor and the Municipality of Anchorage for three years after the NOT is issued.
 - 4. Copies of all SWPPP documents are to be delivered to the Municipality of Anchorage and the Anchorage School District upon completion of the project and before final closeout.
- N. Closeout Checklist Section 01750
 - 1. A closeout checklist is provided for convenience in tracking the necessary documentation and deliverables for project closure. This checklist should be updated and submitted with each closeout deliverable.

1.07 FINAL APPLICATION FOR PAYMENT

- A. Follow procedures specified in General and Special Conditions, and also note miscellaneous prerequisites for final payment noted in this section.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

CLEANING

PART 1. - GENERAL

1.01 DESCRIPTION

- A. Execute cleaning, during progress of the work, and at completion of the work.

1.02 DISPOSAL REQUIREMENTS

- A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2. - PRODUCTS

2.01 MATERIALS

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.

PART 3. - EXECUTION

3.01 DURING CONSTRUCTION

- A. Execute periodic cleaning to keep the work, the site, and adjacent areas free from accumulations of waste materials, rubbish, and debris, resulting from construction operations.
- B. Provide on-site containers for the collection of waste materials, debris, and rubbish.
- C. Remove waste materials, debris, and rubbish from the site periodically and dispose of.

3.02 DUST CONTROL

- A. Clean interior spaces prior to the start of finishing painting and continue cleaning on an as-needed basis until painting is finished.
- B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.

3.03 FINAL CLEANING

- A. Employ skilled workmen for final cleaning.
- B. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.
- C. Prior to final completion, or Owner occupancy, the Contractor shall conduct an inspection of sight-exposed interior surfaces and all work areas to verify that the entire work is clean.

END OF SECTION

PROJECT RECORD DOCUMENTS

PART 1. - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Maintenance of record documents and samples.
- B. Submittal of record documents and samples.

1.02 RELATED REQUIREMENTS

- A. Document 00700 - General Conditions.
- B. Section 01300 - Submittals.
- C. Section 01340 - Shop drawings, Product data and Samples.
- D. Section 01700 - Project closeout.
- E. Individual Specifications Sections: Manufacturer's certificates and certificates of inspection.

1.03 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. In addition to requirements in General Conditions, maintain at the job site for Owner's use one record copy of:
 - 1. Contract Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change orders and other modifications to the Contract.
 - 5. Reviewed shop drawings, product data and samples.
 - 6. Field test records.
 - 7. Inspection certificates.
 - 8. Manufacturer's certificates.
 - 9. Request for Information (RFI)
 - 10. Request for Proposal (RFP)
 - 11. Current Construction Network.
- B. Store record documents and samples in the field office apart from the documents used for construction.
- C. Label and file record documents and samples in accordance with Section number listings in Table of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- D. Maintain record documents in a clean, dry and legible condition. Do not use record documents for construction purposes.

Keep record documents and samples available for inspection by the Project Manager.

1.04 RECORDING

- A. From the copies of Contract Documents to be furnished by Project Manager, the Contractor and/or Subcontractors shall record on a set of clean, new prints each and every change that is made, at time it is made, in red. This includes any changes that are made in partitions, doors, or otherwise in arrangement of construction of buildings as well as a complete record of exact manner in which electrical and mechanical work, piping, etc., are installed. All Change Orders, RFI's, and Information Bulletins shall be incorporated. Dimensions shall be included where necessary to accurately locate piping and other items that will be concealed underground or in finished building that may later be necessary to service.
- B. Contract Drawings: Legibly mark to record actual construction.
1. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
 2. Field changes of dimensions and detail.
 3. Changes made by Change Order and other modifications.
 4. Details not on original contract drawings.
 5. References to related shop drawings and modifications.
- C. Shop Drawings: Maintain as record documents, legibly annotate appropriate drawings to record changes made after review.
- D. Specifications and Addenda: Legibly mark up each section to record:
1. Changes made by Change Order.
 2. Manufacturer, trade name and catalog number of each product actually installed, particularly optional items and substitute items.
 3. Changes made by addenda and modifications.
 4. Other matters not originally specified.
- E. Label each document "PROJECT RECORD" in printed letters.
- F. Keep record documents current. No progress payments will be made until record documents are verified by the Project Manager as being current.
- G. Do not permanently conceal any work until required information has been recorded.
- H. Methodology:
1. Changes to Work are described by source documents, including, but not limited to, Field Directives (FD), Information Bulletins (IB), Requests for Information (RFI), and Requests for Proposals (RFP), and their attachments. (Reference Section 00700, Article 12.)
 2. Project Record drawings are to completely and clearly reflect all Changes to Work by graphically showing actual changes to dimensions, locations, materials, assemblies, and other conditions; by graphically deleting conditions replaced by such changes; and by indicating applicable source document's reference number. Such reference number shall not be the sole representation of Changes to Work shown on Project Record drawings.
 3. Where A/E furnishes supplemental drawings, Project Record drawings are to show both the A/E's supplemental drawing reference number and the source document's reference number at the affected location.

1.05 SUBMITTAL

- A. Prior to Final Completion of the Project, the Contractor and/or Subcontractors under his direction, shall submit records of changes on prints to Project Manager.

- B. Accompany submittal with transmittal letter, to Project Manager, containing:
 - 1. Date
 - 2. Project title and number
 - 3. Contractor's name and address
 - 4. Title and number of each record document
 - 5. Certification that each document as submitted is complete and accurate.
 - 6. Signature of Contractor, or his authorized representative.

PART 2. - PRODUCTS (NOT USED)

PART 3. - EXECUTION (NOT USED)

END OF SECTION

OPERATION AND MAINTANCE DATA

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Format and content of manuals.
- B. Instruction of Owner's personnel.
- C. Schedule of submittals.

1.02 RELATED SECTIONS

- A. Section 01300 - Submittals
- B. Section 01400 - Quality Control
- C. Section 01420 - Special Inspections
- D. Section 01410 - Testing Laboratory Services
- E. Section 01600 - Material and Equipment
- F. Section 01700 - Contract Closeout
- G. Section 01750 - Closeout Forms
- H. Individual Specifications Sections: Specific requirements for operation and maintenance data.

1.03 QUALITY ASSURANCE

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.04 FORMAT

- A. Prepare data in the form of an instructional manual.
- B. Electronic: Optical Character Recognition (OCR) formatted pdf document.
- C. Cover: Identify each pdf with a title "OPERATION AND MAINTENANCE INSTRUCTIONS"; identify title of Project; identify subject matter of contents.
- D. Provide bookmarked pdf for each separate product and system, with typed description of product and major component parts of equipment.
- E. Text: Manufacturer's printed or typewritten data.
- F. Drawings: Provide with O&M documents.
- G. Contents: Prepare a Table of Contents for each volume, with each Product or System description identified, in three parts as follows:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers.
2. Part 2: Operation and maintenance instructions arranged by and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
3. Part 3: Project documents and certificates, including the following:
 - a. Shop drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Photocopies of warranties and bonds.

1.05 CONTENTS, EACH VOLUME

- A. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect/Engineer, Subconsultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.
- B. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- E. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01400.
- F. Warranties and Bonds: Bind in copy of each.

1.06 MANUAL FOR MATERIALS AND FINISHES

- A. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. (Provide information for re-ordering custom manufactured Products.)
- B. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

- C. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: As specified in individual Product specification sections.
- E. Provide a listing in Table of Contents for design data.

1.07 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.
- B. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed
- C. Include color coded wiring diagrams as installed.
- D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Provide servicing and lubrication schedule, and list of lubricants required.
- G. Include manufacturer's printed operation and maintenance instructions.
- H. Include sequence of operation by controls manufacturer.
- I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Provide control diagrams by controls manufacturer as installed.
- K. Provide Contractor's coordination drawings, with color-coded piping diagrams as installed.
- L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Include test and balancing reports as specified.
- O. Additional Requirements: As specified in individual Product specification sections.
- P. Provide a listing in Table of Contents for design data, with tabbed (fly sheet indexed) and space for insertion of data.

1.08 MANUALS

- A. Operating and Maintenance Manuals: Submit electronic manual for each identified category.
 - 1. Air Balance Report
 - 2. Building Commissioning Reports
 - 3. Materials and Finishes Manual
 - 4. Equipment and Systems Manual
 - 5. Digital and Pneumatic Controls Manual
 - 6. Fire Systems Manual
- B. Warranty and Special Warranty Manual: Submit electronic manuals.

1.09 INSTRUCTION OF OWNER PERSONNEL

- A. Before final inspection, instruct Owner's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times.
- B. For equipment requiring seasonal operation, provide instructions for all seasons
- C. Use operation and maintenance manuals as basis for instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.

1.10 SUBMITTALS

- A. Submit copies of preliminary draft or proposed formats and outlines of contents before start of Work. Project Manager will review draft and return copy with comments.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit advance copy of documents within ten days after acceptance. Include same information within final Operations and Maintenance documents.
- C. Submit draft copy of completed volumes 60 days following acceptance of Project Submittals. Allow 20 days for Architect review and return to Contractor. Provide Contractor resubmittal within 14 days. Allow 14 days for Architect review of resubmittal. Revise content of all document sets as required prior to final submission.
- D. Submit fully approved volumes within 115 days after acceptance of Submittals or 10 days prior to Substantial Completion, whichever occurs first.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

CLOSEOUT FORMS

PART 1. - GENERAL

- 1.01 The following forms are to be submitted by the Contractor prior to final project closeout.
- 1.02 CERTIFICATION OF SUBSTANTIAL COMPLETION
- A. Use Anchorage School District Form 101 attached herein.
- 1.03 CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS
- A. Use Anchorage School District Form 102 attached herein.
- 1.04 RELEASE ON CONTRACTS
- A. Use Anchorage School District Form 103 attached herein.
- 1.05 CONSENT OF SURETY COMPANY TO FINAL PAYMENT
- A. Use Anchorage School District Form 104 attached herein.
- 1.06 CONSENT OF SURETY TO REDUCTION IN OR PARTIAL RELEASE OF RETAINAGE
- A. Use Anchorage School District Form 105 attached herein.
- 1.07 CERTIFICATE OF COMPLIANCE
- A. The Contractor shall submit a notarized Certificate of Compliance, contained in this section, with his application for Final Payment.
- 1.08 WARRANTY OF WORK AFTER FINAL PAYMENT
- A. The Contractor shall furnish to the Owner a notarized Warranty of Work after Final Payment, contained in this section, with his application for Final Payment.
- 1.09 AHERA EXCLUSION DOCUMENT
- A. The Contractor shall furnish to the Owner a signed AHERA Exclusion Document, contained in this section, with his application for Final Payment.
- 1.10 DEPARTMENT OF LABOR NOTICE OF COMPLETION OF PUBLIC WORKS
- A. The Contractor shall furnish to the Owner a Notice of Completion of Public Works form approved by the Department of Labor with his application for Final Payment.
- 1.11 DEPARTMENT OF REVENUE TAX CLEARANCE REQUEST FORM
- A. For projects funded through the Department of Education (debt reimbursement or DEED grants), the Contractor shall furnish to the Owner a Tax Clearance Request Form approved by the Department of Revenue with his application for Final Payment.
- 1.12 DEPARTMENT OF LABOR TAX CLEARANCE REQUEST FORM
- A. For projects funded through the Department of Education (debt reimbursement or DEED

grants), the Contractor shall furnish to the Owner a Tax Clearance Request Form approved by the Department of Labor, with his application for Final Payment.

1.13 CLOSEOUT CHECKLIST

- A. The closeout checklist is designed to assist the contractor and project manager in the process of completing the project.

CERTIFICATE OF SUBSTANTIAL COMPLETION

Project: _____ Contract Number: _____

Contractor: _____ Contract Date: _____

Architect: _____ Date of Issuance: _____

Owner: ANCHORAGE SCHOOL DISTRICT
1301 Labar Street
Anchorage, Alaska 99515

Project Description:

The work performed under this contract has been reviewed and found to be substantially complete. The date of Substantial Completion is hereby established as: _____

Definition of Date of Substantial Completion:

The date of substantial completion of the project is the date certified by the Owner when the work is substantially complete in accordance with, and defined in the Contract Documents.

A list of items to be completed or corrected, prepared by the Owner and verified and amended by the Architect is appended hereto. The failure to include any items or such list does not alter the responsibility of the Contractor to complete the project in accordance with the Contract Documents.

The Contractor will complete or correct the work on the list of items appended hereto within 30 days from the date of substantial completion.

The responsibilities of the Owner and the Contractor for maintenance, heat, utilities, and insurance shall be as follows: _____

In reliance upon the certification of the Contractor and the Architect, the Owner hereby accepts the project as substantially complete. In accordance with the Contract Documents, the Owner hereby elects to assume occupancy of _____

_____ at _____ a.m./p.m. on _____

Owner: **ANCHORAGE SCHOOL DISTRICT**

By: _____ Title: _____ Date: _____

Architect:

By: _____ Title: _____ Date: _____

Contractor:

By: _____ Title: _____ Date: _____

ASD 101 (01/03)

**CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS
ANCHORAGE SCHOOL DISTRICT**

WHEREAS, by the terms of a contract dated _____ entered into by the
Anchorage School District, and _____ for the construction of

The undersigned, pursuant to the General Conditions of the Contract for the construction,
_____, hereby certifies that, except as listed below, he has paid
in full or has otherwise satisfied all obligations for all materials and equipment furnished, for all work, labor, and services
performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in
connection with the performance of the Contract referenced above for which the District or his property might in any way
be held responsible.

EXCEPTIONS:

IN WITNESS WHEREOF, the seal of the undersigned Contractor have been hereunto set this
_____ day of

_____, at _____

By _____

_____ being first duly sworn, say that I am the agent for and executed
the foregoing under authority of said company to do so; that I have read the same, know the contents thereof, and the
matters set forth therein are as I truly believe.

By _____

Subscribed and sworn to before me this _____ day of _____

_____, at _____

Notary Public in and for _____
My Commission Expires _____

**RELEASE ON CONTRACT
ANCHORAGE SCHOOL DISTRICT**

WHEREAS, by the terms of a contract dated _____ entered into by the Anchorage School District,
and _____ for the construction of _____

_____, it is provided that:
"Neither the final payment nor the remaining retained percentage shall become due until the Contractor shall provide the Owner (1) with a waiver and release of liens, on the forms provided by the Owner, executed by the Contractor..."

NOW THEREFORE, in consideration of the premises and the payment by the Anchorage School District to the undersigned Contractor of the amounts due under the contract and any changes or modifications thereto, to wit, the sum

of \$ _____ Dollars,
(Numbers)
(In Words)

the undersigned Contractor hereby releases and forever discharges the Anchorage School District including its property, particularly that real property known as:

_____ of the Anchorage School District, of and from all manner of debts, dues and sum or sums of money, accounts, claims, and demands whatsoever, in Law and in equity, under or by virtue of said contract, and warrants good title to all material, supplies and equipment installed or incorporated in the project and all work delivered to the premises, together with all improvements and appurtenances constructed thereon by:

_____ to the Anchorage School District free of any claims, liens or encumbrances. Neither the undersigned nor any person, firm or corporation furnishing material or labor for any work covered by this Contract has any right to a lien upon the premises nor improvement thereon, except:

IN WITNESS WHEREOF, the signature of the undersigned Contractor has been hereunto set this

_____ day of _____, 20__, at _____, Alaska.

Signature: _____

Printed Name: _____

I, _____, being first duly sworn, say that I am the agent for and executed the foregoing under authority of said company to do so; that I have read the same, know the contents thereof, and the matters set forth therein are as I truly believe.

Signature: _____

Subscribed and sworn to before me this _____ day of _____, 20__, at _____, Alaska.

Notary Public in and for _____

My Commission Expires: _____.

ASD Form 103

**CONSENT OF SURETY COMPANY
TO FINAL PAYMENT**

PROJECT: _____ **PROJECT NUMBER:** _____

TO: Anchorage School District **CONTRACT DATE:** _____

CONTRACTOR: _____

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above:

(Surety Company)

on bond of

(Contractor)

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety Company of any of its obligations to **Anchorage School District, Owner** as set forth in said Surety Company's bond. Surety expressly agrees that any and all valid claims of sub-Contractors and all persons supplying labor or materials to the project will be satisfied by Contractor or Surety in a timely manner

IN WITNESS WHEREOF, the Surety Company has hereunto set its hand this

day of _____, 20_.

Name of Surety Company

Attest

Signature of Authorized Representative

Title

ASD 104

**CONSENT OF SURETY TO REDUCTION IN OR PARTIAL RELEASE OF RETAINAGE
ANCHORAGE SCHOOL DISTRICT**

PROJECT: _____ **PROJECT NUMBER:** _____
TO: Anchorage School District **CONTRACT DATE:** _____
CONTRACTOR: _____

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the:

_____ (Surety Company)
on bond of
_____ (Contractor)

HEREBY APPROVES OF THE REDUCTION IN OR PARTIAL RELEASE OF RETAINAGE to the Contractor as follows:

The surety agrees that such reduction in or partial release of retainage to the Contractor shall not relieve the Surety of any of its obligations to **ANCHORAGE SCHOOL DISTRICT, OWNER**

IN WITNESS WHEREOF, the Surety Company has hereunto set its hand this
day of .

Name of Surety Company

Attest

Signature of Authorized Representative

Title

ASDF Form 105

CERTIFICATE OF COMPLIANCE

No final payment shall be made until the Contractor shall file with the Owner, prior to acceptance of the work, a notarized Certification of Compliance in the following form:

The Contractor does hereby certify that all work has been performed and materials supplied in accordance with the Drawings, Specifications and Contract Documents for the above work, and that:

No less than the prevailing rates of wages as ascertained by the governing body of the Contracting Agency has been paid to laborers, workmen and mechanics employed on this work;

There have been no unauthorized substitutions of Subcontractors; nor have any subcontracts been entered into without prior notice having been submitted to the Owner prior to the start of such subcontracted work;

No subcontract was assigned or transferred or performed by any Subcontractor other than the original Subcontractor, without prior notice having been submitted to the Owner together with the names of all Subcontractors;

All claims for material and labor and other paid service performed in connection with these specifications have been paid;

All monies due the State Industrial Accident Fund, the State Unemployment Compensation Trust Fund, the State Tax Commission, Hospital Associations and/or others have been paid.

In WITNESS WHEREOF, the undersigned has signed and sealed this instrument this

_____ day of _____, 20__.

(Firm Name)

(Signature)

(Title)

(Attest)

(SEAL IF BIDDER IS A CORPORATION)

As determined necessary, evidence of compliance may be required to be submitted with and made a part of this Certificate of Compliance.

WARRANTY OF WORK

Prior to Final Payment, the Contractor shall furnish to the Owner a Warranty of Work in the following form:

The Contractor does hereby warrant all work and materials to be in full and complete accordance with the Contract Documents and Agreement between Owner and Contractor, and requirements appertaining thereto; that all work and materials are free from any and all defects and imperfections, and fully suitable for the use and purposes for which each and every part is intended. The Contractor also agrees that, should any defect develop or appear which the Project Manager or Owner's Representative finds was Not caused by improper use, the Contractor shall promptly, upon demand, fully correct, substitute and make good any such defective material without any cost to the Owner and will save the Owner harmless against any claim, demand, loss or damage by reason of any breach of this warranty.

The period of this warranty shall commence on the date of Substantial Completion.

The warranty shall continue to be in full force and effect for the period of one (1) year, except for those items for which a longer period of warranty is specifically stated in the Warranties for work in Technical Sections of the Specifications.

Warranties for work stated in Technical Section shall continue in full force and effect for the respective periods expressly stated.

In WITNESS WHERE, the undersigned has signed and sealed this instrument this

_____ day of _____, 20__.

(Firm Name) _____

(Signature) _____

(Title) _____

(Attest) _____

(SEAL IF BIDDER IS A CORPORATION)

AHERA Exclusion Document

Contractor's Verification of Asbestos-Free Construction

Project: _____ **Project Number:** _____

Contractor: _____ **Date:** _____

To: Anchorage School District
Facilities Coordinator,
AHERA LEA Designated Person

To the best of our knowledge, no asbestos-containing building materials were installed in this project.

Attest: _____
Signature of Authorized Representative

Title

Department of Labor and Workforce Development
 Labor Standards and Safety Division
 Wage and Hour Administration
 www.labor.state.ak.us/lss/lss.htm



NOTICE OF COMPLETION OF PUBLIC WORKS

Additional Filing Fee May Be Required

- This form must be typed or printed in ink.
- Fill in all blanks or form will be returned for correction (see back).
- Please allow a minimum of 30 working days for processing.

ENTER YOUR FAX # _____
 AND LIST YOUR MAILING ADDRESS BELOW

Contractor, company or agency name, address, city, state & ZIP + 4

Project Name	Contract #	
Contract awarding agency		
Address		
City	State	ZIP + 4
Contract awarding agency contact person		Phone #
Location and city where work was performed		
DOLWD Project #		
Project Completion Date / /		

Primary contractor (has contract with the public agency)

IF YOU HAVE ALREADY PAID \$5,000 IN FEES FOR THIS PROJECT, OR IF YOU PREVIOUSLY PAID ALL FEES DUE AND DID NOT HAVE ANY INCREASES IN CONTRACT AMOUNTS ENTER "NONE" AND, SKIP TO CERTIFICATION. OTHERWISE, DESCRIBE ADDITIONAL WORK.

Description of additional contract/subcontract work performed	Name of contractor who performed this work	Amount of subcontract
CERTIFICATION: I hereby certify that the above information is correct. Enclosed is the additional filing fee computed at 1% of the total amount of all new contracts on this project, including the contract price of new work performed by the primary contractor not previously reported on the Notice of Work, up to a maximum of \$5,000. I also certify that all contractors who worked on this project complied with prevailing wage requirements as described in AS 36.05.010-.110 and AS 36.10.007-.990.	Total value of additional subcontracts	\$
	Additional value of work performed by primary contractor	\$ +
	Amount subject to fee	\$
	Multiply by .01	
	Supplemental fee enclosed = ROUND FEES TO NEAREST DOLLAR	\$
For Dept. Use Only		
Signature _____	Date _____	Amount: _____ Check Number: _____ Cash _____ Received By: _____ Date: _____ Credit Card Confirmation _____ Visa ___ MC _____ Project Name _____ DOLWD Project # _____
Title _____		
Fax # _____	Phone # _____	
For Dept. Use Only		
T-36 Clearance Approved By _____ Department of Labor and Workforce Development		Wage & Hour date-stamped copy of this form will serve as temporary receipt.

How to expedite the processing of your form:

ERRORS THAT CAUSE REJECTION

No fee included or incorrect amount. If total contract amount is less than \$25,000 no filing fee is required. Contract amounts paid to owner/operators with no employees are exempt from the fee. **The maximum total filing fee for any one project is \$5,000.00.**

Missing - Value of work performed by primary contractor.

Missing – The name of each **NEW** subcontractor and the amount of the contract OR the name of existing subcontractors and the amount of any **NEW** work not previously reported on the Notice of Work.

Missing – Notice of Completion of Public Works must be signed by an authorized representative.

FILING INSTRUCTIONS

Additional fees are required for any increase in contract value, unless the maximum fee (\$5,000) has been paid.

If there is not enough space to list all required information on one form, use additional sheets. Please indicate at the top of each sheet “Page 1 of 2”, “Page 2 of 2”, etc. No other attachments will be accepted.

A Wage and Hour Administration (WH) date-stamped copy of this form will serve as a temporary receipt, while the acceptance of fees is processed. WH will mail or fax the approved copy of this form to the organization provided on the front of this form. Make a copy for your records. This will serve as your notice that the fees paid have been accepted by WH.

For questions call the nearest WH office:

Juneau: (907) 465-4842 Anchorage: (907) 269-4900 Fairbanks: (907) 451-2886

For more forms, see www.labor.state.ak.us/lss/lssforms.htm

Submit the notice and the appropriate filing fee to:

Alaska Department of Labor and Workforce Development
Wage and Hour Administration
3301 Eagle Street, Ste. 301
Anchorage, AK 99503-4149

If no fee is required, you may fax the notice to (907) 269-4915

**Alaska Department of Revenue
TAX CLEARANCE REQUEST FORM**

Applicant's Name: _____

EIN/SSN: _____

Mailing Address: _____

City/State/Zip Code: _____

I hereby authorize the Alaska Department of Revenue to release to

(Name of Department or Agency)

Department's Statute on tax clearance: _____

whose facsimile number or email address is _____

confirmation that all taxes, penalties and interest due the Department of Revenue have been paid and that there are no outstanding amounts due.

Signed: _____

Printed Name: _____

Title*: _____

*If tax clearance is being requested on behalf of a corporation/LLC/partnership, must be signed by an officer/member/partner.

Send completed form by email to the Department of Revenue at DOR.tax.accounting@alaska.gov

<i>DEPARTMENT USE ONLY</i>	
<input type="checkbox"/>	<i>The above applicant is current on all taxes, penalties and interest due and is in good standing with the Alaska Department of Revenue.</i>
<input type="checkbox"/>	<i>The above applicant is not current on all taxes, penalties and interest due and is not in good standing with the Alaska Department of Revenue.</i>
_____ <i>Department of Revenue Representative</i>	_____ <i>Date</i>

TaxClearanceRequestForm (Rev 2/21)



THE STATE of ALASKA GOVERNOR MICHAEL J. DUNLEAVY

Department of Labor and Workforce Development

Division of Employment and Training Services Employment Security Tax

P.O. Box 115509 Juneau, AK 99811-5509 Relay Alaska (in state): (800) 770-8973 or 7.1.1 Relay Alaska (out of state): (800) 770-8255 Toll free: (888) 448-2937 Phone: (907) 465-2787 Fax: (907) 465-2374

Tax Clearance Request Form for Contractors

Date of request: _____

Business name of the contractor a Tax Clearance is being requested for: _____

Business address: _____

Business contact phone number: _____

Federal Identification Number: _____

Alaska Employer Account Number: _____

Specific time period a tax clearance is being requested for (i.e. beginning and ending date of a subcontract agreement):

Subcontract project name: _____

Name and address of the person this Tax Clearance is to be returned to: _____

Comments or additional information: _____

For agency use only:

- checkbox Tax Clearance is granted
checkbox Tax Clearance is not granted (please have employer contact the department)
checkbox No account on file, liability unknown (please have employer contact the department)
checkbox Employer has stated no employees, Tax Clearance not required.

Agency representative signature: _____ Date: _____

Agency representative title: _____

We are an equal opportunity employer/program. Auxiliary aids and services are available upon request to individuals with disabilities. labor.alaska.gov/estax

Rev. 8/2018

Project Title: _____ Project Number: _____

PROJECT CLOSEOUT CHECKLIST	Number Required	Number & Date Delivered
Inspection Documents		
Substantial Completion Inspection Documents	1	
Substantial Completion Punch List	1	
Final Inspection Documents	1	
Final Inspection Punch List	1	
Certificate of Substantial Completion (ASD Form 101)	1	
Contractor Submittals		
As-built drawings to Engineer of Record (Section 01700)	1	
All project record documents (Section 01720)	1	
Maintenance and Operations Manuals – Electronic version – OCR pdf (Section 01730)	1	
Warranty and Special Warranty Manuals (Section 01730)	4	
Certificate of Domestic Water Disinfection (Section 01700)	2	
Warranty of Work (Section 01750)	1	
Certificate of Compliance (Section 01750)	1	
Building Officials Certificate of Mechanical and Electrical Inspection	3	
Building Official's Certificate of Occupancy	3	
Building Official's Certificate of Completion	3	
AHERA Response Action Report (RAR)	1	
AHERA Exclusion Document (Section 00630)	1	
Return school keys to lock shop	1	
Lock Shop Release Form (signed)	1	

Project Title: _____

Project Number: _____

PROJECT CLOSEOUT CHECKLIST	Number Required	Number & Date Delivered
Contractor's Affidavit of Payment of Debts and Claims (ASD Form 102)	1	
Consent of Surety Company to Final Payment (ASD Form 104)	1	
Release on Contract (ASD Form 103)	1	
Consent of Surety to Reduction in/or Partial Release of Retainage (ASD Form 105)	1	
Engineered As-built drawings and special system drawings on reproducible CD's (not zipped)	1	
Engineered As-built drawings and special system drawings on bond/blacklines	2	
Spare Parts deliverables	1	
Copy of Warranty for all items with Extended Warranty	1	
Notice of Completion of Public Works (Section 00630) (Approved DOL Clearance Form)	1	
Dept. of Revenue Tax Clearance Form (Section 00630) (Approved DOR Tax Clearance Form)	1	
Dept. of Labor Tax Clearance Form (Section 00630) (Approved DOL Tax Clearance Form)	1	
Apprenticeship Program - Purchasing release for final payment (projects over \$100,000)		
Final Application and Certificate for Payment (ASD Form 100A-C)	1	
Base Access Pass(s) returned to Project Manager		NA

Project Manager Signature

Date

END OF SECTION

UTILITY LOCATION REQUIREMENTS

PART 1. - GENERAL

1.01 DESCRIPTION

- A. Upon receipt of written notification from any of public agencies or utilities that Contractor has caused damage to any facility, equipment or installation of agency, and Contractor failed to request a utility locate service from said utility at least two (2) normal business days prior to damage, or if locate services was properly requested, that damage was not approximately caused by error in locate service, Owner will withhold from forthcoming or accrued Contract payment, including advances, a sum sufficient to protect agency or utility from loss. Public agencies or utilities that provide notice of facility damage under this paragraph are:

Anchorage Water and Wastewater Utility
Alaska Communications Systems
Alaska Fiber Star
Alaska Native Medical Center
Alaska Railroad Corporation
Alyeska Cable / TelAlaska
Anchorage School District
Aircraft Service International Group
AT&T Alascom
Chugach Electric Association, Inc.
Department of Transportation Street Lights, State of Alaska
Enstar Natural Gas Company
Flint Hills Resources/Williams Alaska Pipeline
GCI Cable
Matanuska Electric Association
Matanuska Telephone Association
Municipality of Anchorage/Department of Public Works
Municipal Light & Power Utility
Tesoro Alaska Inc.

- B. Upon receipt of release of claim by notifying utility or upon judgment of a court having jurisdiction in matter and having established that Contractor is liable for a lesser amount or is not liable for damage, Owner will release excess funds to Contractor. Funds withheld pursuant to this provision shall not bear interest. Upon receipt of satisfactory evidence against Contractor in court of competent jurisdiction within sixty (60) days after discovery of damage, Owner shall release funds withheld pursuant to this provision.

1.02 PROTECTION OF UTILITIES

- A. Any pipes or other utilities encountered in excavation shall be shored up and cared for by Contractor as to leave them in a proper working condition until such times as Owner determines what shall be done with them.
- B. Any utilities mislocated or inadequately located by appropriate utility company which are damaged by Contractor shall not constitute reimbursement or time extensions to Contractor from Owner for repair(s) of work that Contractor performs.
- C. Contractor shall coordinate his work to cooperate with original utility service installed.

PART 2. - PRODUCTS (NOT USED)

PART 3. - EXECUTION (NOT USED)

END OF SECTION

HAZARDOUS MATERIALS ASSESSMENT

PART 1 – GENERAL

1.1. NOTIFICATIONS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.2. SECTION INCLUDES

- A. This section contains the Hazardous Materials Assessment for the project. The Hazardous Materials Assessment is provided for information only, does not contain any specific contractual requirements related to the project or require the submittal of any items, and is subject to the limitations contained in the Assessment.
- B. This section does not apply to or address requirements related to any specific health, safety, or environmental concerns or conditions which may be present at this site.

1.3. CONTRACT DOCUMENTS AND RELATED REQUIREMENTS

- A. Drawings and general provisions of the contract, including general and supplementary conditions and other Division 00, 01, and 02 specifications, apply to the work of this section. The contract documents show or describe the work to be done under the contract including related requirements and conditions impacting the project. Related requirements and conditions include, but are not limited to, applicable codes and regulations, notices and permits, existing site conditions and restrictions on use of the site, security of the site, requirements for partial owner occupancy during the work, coordination with other work and the phasing of the work, among others. In the event the Contractor discovers a conflict in the contract documents and/or requirements, the conflict must be brought to the immediate attention of the Owner for resolution. Whenever there is a conflict or overlap in the requirements, the most stringent shall apply. Any actions taken by the Contractor without authorization from the Owner shall become the sole risk and responsibility of the Contractor. All costs incurred due to such action are also the responsibility of the Contractor.

1.4. RELATED WORK

- A. 02 82 33 – Removal and Disposal of Asbestos Containing Materials
- B. 02 88 00 – Removal and Disposal of Miscellaneous Hazardous Materials

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

Hazardous Materials Assessment

Anchorage School District (ASD)
Spring Hill Elementary School Roof Replacement,
Spring Hill Elementary School,
9911 Lake Otis Parkway,
Anchorage, Alaska 99507



Assessment Date: February 10 & 28, 2024
Report Date: February 14, 2024
HTRW, LLC Project No.: 2024-05

	<h1>HTRW</h1> , LLC
HAZARDOUS BUILDING MATERIALS CONSULTING 11471 BUSINESS BLVD., #773442, EAGLE RIVER, AK 99577 (907) 917-3801 • (917) 203-7517 (FAX) • CONTACT@HTRW-LLC.COM	

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APPENDIX B - LEAD

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APPENDIX C – OTHER COMMON HAZARDOUS BUILDING MATERIAL (NO SAMPLING OF THESE MATERIALS WAS PERFORMED)

APPENDIX D – DRAWINGS OF ASBESTOS AND LEAD TEST LOCATIONS

APPENDIX E – SUPPLEMENTAL INFORMATION

1. Introduction and Executive Summary

Under contract to MCG Explore Design, HTRW, LLC performed a hazardous building materials assessment of portions of Spring Hill Elementary School located at 9911 Lake Otis Parkway in Anchorage, Alaska 99507. The objective of the assessment was to identify **common hazardous building materials** that may be affected by the proposed Spring Hill Elementary School Roof Replacement Project. Mr. Christopher T. Ottosen of HTRW, LLC performed the assessment on February 10 & 28, 2024 while the site was unoccupied.

The following **common hazardous building materials** were identified in the building: asbestos-containing materials, lead-containing materials, mercury-containing materials, ozone depleting substances (ODS), heat transfer fluids, and materials with radioactive components.

These **common hazardous building materials** are regulated to varying degrees, and in general, require the use of qualified firms using workers who are trained in the safe handling, removal, and disposal of these various materials. The regulations governing the removal of the **common hazardous building materials** addressed by this report are intended to ensure the health and safety of persons and the environment. Failure to adhere to the requirements of the governing regulations may result in an uncontrolled release of the materials, potentially exposing persons or the environment to the hazardous effects of the materials. Failure to comply with the regulations may invoke regulatory enforcement action such as fines, citations, and penalties, or may lead to litigation from those parties potentially exposed to the hazards.

A summary of the **common hazardous building materials** is presented in the following tables. Refer to discussions in the remainder of this report and information contained within the appendices of this report for additional detailed information regarding these materials.

ASBESTOS		
MATERIAL DESCRIPTION	EPA CATEGORY	ASSUMED/ CONFIRMED
Miscellaneous asphaltic roof tars, mastics, and sealants on all roofing types and eras	1	A
Flange gaskets on piping systems	1	A
Flange gaskets on the generator exhaust and muffler	1	C
Valve packings	1	A
Thin crispy black foundation dampproofing	1	A
Various colors and patterns of 12" x 12" vinyl floor tile	1	NOB
Black flooring mastic	2	NOB
Sticky sealants used on seams, flashings, trim pieces, etc. throughout the standing seam metal roofing, confirmed in colors of grey and light grey, and at <1% in a dark red sealant	2	C
Tan sealants used on the seams of HVAC system components	2	C
Grey sealants used on the seams of HVAC system components	2	C
Lining of clock-speaker box housings, clock housings, and speaker housings	2	A
Various colors of undercoatings on the bottom of stainless steel sinks and drinking fountains	2	A

ASBESTOS		
MATERIAL DESCRIPTION	EPA CATEGORY	ASSUMED/ CONFIRMED
Black undercoatings on the bottom of stainless steel drinking fountains	2	A
Grouts, mastics, and mortars for ceramic mosaic floor tiles and wall bases	2	A
Various materials used inside of electrical enclosures	2	A
Insulating materials inside of doors	RACM	A
Standby generator gaskets, sealants, and insulating materials	V	A
Light grey spongy sealant commonly used with the EPDM-like membranes used at VTR penetrations and below the clerestory and louver "walls"	<1%	C
Hard black gasket and associated black sticky gum-like sealant used between the wire glass clerestory glazing and the metal window casing	<1%	C
Off-white gum-like putty used at duct flanges of supply air, return air, and outside air systems	<1%	C

Notes to Asbestos-Containing Materials Table:

- Materials labeled with a "C" designation are materials which have been confirmed to contain asbestos.
- Materials labeled with an "A" designation are materials which are assumed to contain asbestos.
- Materials labeled with an "NOB" designation are materials which are classified as a "Non-Friable Organically Bound Material" which were sampled and did not contain asbestos or contained ≤1% asbestos by PLM that are assumed to contain asbestos in greater than 1% if analyzed by TEM NOB.
- Materials labeled as ≤1% contained asbestos at concentrations of less than or equal to one percent.
- Materials labeled with an "NAD" designation are materials which were sufficiently sampled and found not to contain asbestos.
- Materials labeled with a "None" designation are materials which were not observed and not believed to be present.
- Materials labeled with a "-" means there was not enough information to determine if the material was present in the individual building, but it does not mean that the material is not present or that the material does not contain asbestos.
- Where EPA Category is labeled as "V", the materials are typically part of an assembly and may have more than one EPA Category material.

LEAD		
MATERIAL DESCRIPTION	EPA CATEGORY	ASSUMED/ CONFIRMED
Lead-containing paints	Unclassified*	C
Paints classified as "lead-based" paint by the EPA	Unclassified*	A
Metallic lead in solder on copper piping	RCRA exempt scrap metal*	C
Metallic poured lead sealants in bell and spigot pipe connections	RCRA exempt scrap metal*	A
Metallic lead in VTR flashings	RCRA exempt scrap metal*	None
Metallic lead inside of roof drain bowls at clamping rings	RCRA exempt scrap metal*	None

LEAD		
MATERIAL DESCRIPTION	EPA CATEGORY	ASSUMED/ CONFIRMED
Metallic sheet lead	RCRA exempt scrap metal*	None
Lead-acid batteries	Universal waste battery	C
Glazings of ceramic/porcelain wall tiles	Unclassified*	A
Glazings of ceramic/porcelain plumbing fixtures	Unclassified*	A
"Formica" laminate panels on cabinetry and countertops	Unclassified*	C
Plastic and vinyl products	Unclassified*	A

Notes to Lead-Containing Materials Table:

- Materials labeled with a "C" designation are materials which have been confirmed to contain lead.
- Materials labeled with an "A" designation are materials which are assumed to contain lead.
- Materials labeled with a "None" designation are materials which were not observed and not believed to be present.
- Materials labeled with a "-" means there was not enough information to determine if the material was present in the individual building, but it does not mean that the material is not present or that the material does not contain lead.
- Materials labeled with "RCRA exempt scrap metal*" means the material is exempt from RCRA hazardous waste regulations only if recycled.
- Materials labeled with "Unclassified*" means the material requires additional testing to characterize the materials as a non-hazardous lead-containing waste or a RCRA hazardous waste for exhibiting the toxicity characteristic for lead.

OTHER COMMON HAZARDOUS BUILDING MATERIALS		
MATERIAL DESCRIPTION	EPA CATEGORY	ASSUMED/ CONFIRMED
Mercury-containing lamps, fluorescent	Universal Waste	None
Mercury-containing lamps, high intensity discharge	Universal Waste	None
Mercury-containing lamps, neon	Universal Waste	None
Mercury-containing equipment, thermostats	Universal Waste	-
Mercury-containing equipment, HVAC system control switches	Universal Waste	-
Poured polyurethane flooring classified as a hazardous waste for mercury	RCRA Hazardous Waste	Removed
PCB-containing light ballasts	TSCA PCB Bulk Product Waste and/or TSCA PCB Equipment	None

OTHER COMMON HAZARDOUS BUILDING MATERIALS		
MATERIAL DESCRIPTION	EPA CATEGORY	ASSUMED/ CONFIRMED
Contamination from leaking PCB-containing light ballasts	TSCA PCB Contaminated Electrical Equipment	None
Any material or product which contains greater than 1 mg/Kg of total PCBs	Alaska DEC Regulated PCB Waste	-
Any manufactured article, other than a PCB Container, that contains PCBs and whose surface(s) has been in direct contact with PCBs. "PCB Article" includes capacitors, transformers, electric motors, pumps, pipes and any other manufactured item: (1) which is formed to a specific shape or design during manufacture, (2) which has end use function(s) dependent in whole or in part upon its shape or design during end use, and (3) which has either no change of chemical composition during its end use or only those changes of composition which have no commercial purpose separate from that of the PCB Article	TSCA PCB Article	-
Any package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB Articles or PCB Equipment, and whose surface(s) has not been in direct contact with PCBs	TSCA PCB Article Container	-
Any package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs or PCB Articles and whose surface(s) has been in direct contact with PCBs	TSCA PCB Container	-
A non-liquid material containing PCBs at concentrations ≥ 50 ppm but < 500 ppm; a liquid material containing PCBs at concentrations ≥ 50 ppm but < 500 ppm or where insufficient liquid material is available for analysis, a non-porous surface having a surface concentration $> 10 \mu\text{g}/100 \text{ cm}^2$ but $< 100 \mu\text{g}/100 \text{ cm}^2$, measured by a standard wipe test as defined in § 761.123.	TSCA PCB-Contaminated	-
Any electrical equipment including, but not limited to, transformers (including those used in railway locomotives and self-propelled cars), capacitors, circuit breakers, reclosers, voltage regulators, switches (including sectionalizers and motor starters), electromagnets, and cable, that contains PCBs at concentrations of ≥ 50 ppm and < 500 ppm in the contaminating fluid. In the absence of liquids, electrical equipment is PCB-Contaminated if it has PCBs at $> 10 \mu\text{g}/100 \text{ cm}^2$ and $< 100 \mu\text{g}/100 \text{ cm}^2$ as measured by a standard wipe test (as defined in § 761.123) of a non-porous surface	TSCA PCB-Contaminated Electrical Equipment	-
Any manufactured item, other than a PCB Container or a PCB Article Container, which contains a PCB Article or other PCB Equipment, and includes microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures	TSCA PCB Equipment	-

OTHER COMMON HAZARDOUS BUILDING MATERIALS		
MATERIAL DESCRIPTION	EPA CATEGORY	ASSUMED/ CONFIRMED
PCB waste that is generated by residents on the premises of a temporary or permanent residence for individuals (including individually owned or rented units of a multi-unit construction), and that is composed primarily of materials found in wastes generated by consumers in their homes. PCB household waste includes unwanted or discarded non-commercial vehicles (prior to shredding), household items, and appliances or appliance parts and wastes generated on the premises of a residence for individuals as a result of routine household maintenance by or on behalf of the resident. Bulk or commingled liquid PCB wastes at concentrations of ≥ 50 ppm, demolition and renovation wastes, and industrial or heavy duty equipment with PCBs are not household wastes	TSCA PCB Household Waste	-
Any PCB Article, PCB Article Container, PCB Container, PCB Equipment, or anything that deliberately or unintentionally contains or has as a part of it any PCB or PCBs	TSCA PCB Item	-
PCBs regulated for disposal under subpart D of 40 CFR 761 that also contain source, special nuclear, or byproduct material subject to regulation under the Atomic Energy Act of 1954, as amended, or naturally-occurring or accelerator-produced radioactive material	TSCA PCB/radioactive waste	-
Waste containing PCBs as a result of a spill, release, or other unauthorized disposal, at the following concentrations: Materials disposed of prior to April 18, 1978, that are currently at concentrations ≥ 50 ppm PCBs, regardless of the concentration of the original spill; materials which are currently at any volume or concentration where the original source was ≥ 500 ppm PCBs beginning on April 18, 1978, or ≥ 50 ppm PCBs beginning on July 2, 1979; and materials which are currently at any concentration if the PCBs are spilled or released from a source not authorized for use under this part. PCB remediation waste means soil, rags, and other debris generated as a result of any PCB spill cleanup, including, but not limited to: (1) Environmental media containing PCBs, such as soil and gravel; dredged materials, such as sediments, settled sediment fines, and aqueous decantate from sediment. (2) Sewage sludge containing < 50 ppm PCBs and not in use according to § 761.20(a)(4); PCB sewage sludge; commercial or industrial sludge contaminated as the result of a spill of PCBs including sludges located in or removed from any pollution control device; aqueous decantate from an industrial sludge. (3) Buildings and other man-made structures (such as concrete floors, wood floors, or walls contaminated from a leaking PCB or PCB-Contaminated Transformer), porous surfaces, and non-porous surfaces	TSCA PCB Remediation Waste	-
Domestic septage as defined in 40 CFR 503.9 inside of the septic tanks	TSCA PCB Sewage Sludge	-
All electrical transformers at the building, including those in loose electrical equipment, with less than 3 pounds of fluid, circuit breakers, reclosers, oil-filled cable, and rectifiers	Alaska DEC Regulated PCB Waste	-
All electrical equipment at the building that has capacitors of any size or age, including those in loose electrical equipment	TSCA PCB Capacitor	-

OTHER COMMON HAZARDOUS BUILDING MATERIALS		
MATERIAL DESCRIPTION	EPA CATEGORY	ASSUMED/ CONFIRMED
PCB-containing equipment	TSCA PCB waste, category varies	-
Ozone Depleting Substances (ODS), consumer-grade refrigerators	CAA Class I or Class II Controlled Substance	C
Ozone Depleting Substances (ODS), consumer-grade freezers	CAA Class I or Class II Controlled Substance	C
Ozone Depleting Substances (ODS), consumer-grade air conditioning equipment	CAA Class I or Class II Controlled Substance	A
Ozone Depleting Substances (ODS), commercial-grade refrigerators	CAA Class I or Class II Controlled Substance	C
Ozone Depleting Substances (ODS), commercial-grade freezers	CAA Class I or Class II Controlled Substance	C
Ozone Depleting Substances (ODS), commercial-grade air conditioning systems	CAA Class I or Class II Controlled Substance	A
Ozone Depleting Substances (ODS), drinking fountains	CAA Class I or Class II Controlled Substance	A
Ozone Depleting Substances (ODS), Halons	CAA Class I or Class II Controlled Substance	-
Ozone Depleting Substances (ODS), Other	CAA Class I or Class II Controlled Substance	A
Radioactive materials in self-illuminating exit signs	NRC Generally Licensed Waste	C
Radioactive materials in smoke detectors	NRC Generally Licensed Waste	A
Heat transfer fluids, glycol-based	Unclassified*	C
Heat transfer fluids, water-based	Unclassified*	None
Heat transfer fluids, unknown system contents	Unclassified*	C

Notes to Other Common Hazardous Building Materials Table:

- Materials labeled with a "C" designation are materials which have been confirmed to be present.
- Materials labeled with an "A" designation are materials which are assumed to be present.
- Materials labeled with a "None" designation are materials which were not observed and not believed to be present.
- Materials labeled with a "-" means there was not enough information to determine if the material was present in the individual building, but it does not mean that the material is not present or that the material does not contain other potentially hazardous materials or components.
- Materials labeled with "Unclassified*" means the material requires additional testing to characterize the materials.

2. Generalized Building/Site Descriptions

Spring Hill Elementary School was originally constructed in 1985. The original construction was based on a prototypical school design shared by four other schools in the Anchorage School District. The prototypical design is characterized by a roughly "Z-shaped" floor plan containing two classroom wings and a central core area. At Spring Hill Elementary School, there is a classroom wing extending to the west from the southwest side of the central core area and a classroom wing extending to the east from the northeast side of the central core area.

The building has a cast-in-place concrete slab-on-grade foundation with concrete block foundation walls and cast-in-place concrete footings. Above grade, the building's structure consisted mainly of reinforced concrete block walls along with various structural steel columns, beams, and open web steel joists. Corrugated metal floor decks with cast-in-place concrete floor slabs were present in the fan rooms.

Floor finishes throughout the building varied depending on the use of the area. Classrooms throughout the classroom wings had 12" x 12" vinyl floor tiles in the sink, restroom, and coat rack areas and carpet throughout the remaining portion of the classrooms. Portions of the rooms in the southwest wing and the Front Office 148 had a newer laminate plank flooring in a wood grain pattern. 12" x 12" vinyl floor tiles were also present in BPO 126, the central portions of MPR 130, Storage 151, Nurse 152, Work Room 153, Custodial 154, and Staff 156. Restrooms and bathrooms outside of the classrooms had ceramic mosaic floor tile, as did the small room at the southwest corner of the IMC. Terrazzo flooring was present throughout corridors, the Art Room, at the entry to the Front Office, and at the south, east, and west perimeters of the MPR. "Raised dot" rubber flooring was found on the stairs leading to the MPR from the front entry area, near the center of Library at the top of the stairs leading to the IMC, in the shower in Nurse 152A, and at the ramp in Corridor 300. The Gym had a poured polyurethane floor which appeared to have been a replacement material. The two fan rooms, Boiler Room, Generator Room, Electrical Room, Book Storage 133, Gym Storage 137, Kiln Room, and both storage rooms in the Art Room had concrete floors. Quarry tile was present in the Kitchen and its office. All remaining areas had carpet.

Similarly, wall finishes varied throughout the building. Classrooms throughout the classroom wings typically had gypsum board walls throughout except for the lower portions of the walls common to the corridor which had concrete block. Full height gypsum board was found throughout the Art Room, Kiln Room, both storage rooms for the Art Room, Stage 132 and its office, both fan rooms, Offices 144-3 and 144-4, the Front Office 148, Principal's Office 149, Computer Lab 163, and Office 174. Remaining areas of the building had various combinations of concrete block and gypsum board, with much of the building having concrete block up to approximately 8'-6" with gypsum board above. Portions of the Gym and MPR had acoustic wall panels at the mid-level of the walls. Moveable partitions were also present in most classrooms and on the north and south sides of the Stage.

Ceilings throughout the classrooms typically had gypsum board over the areas with 12" x 12" vinyl floor tiles discussed above with remaining areas having a lay-in ceiling. Lay-in ceilings were also present in the corridors of the central core area, throughout the Library/IMC area, the front administrative areas north of Corridor 200 and west

of Corridor 100, and Offices 134 and 135. 12" x 12" glued-on ceiling tiles were present in the upper clerestory areas of the classroom corridors, throughout the Art and Kiln Room, and portions of the ceilings of the MPR, Stage, and Gym. Gypsum board ceilings and soffits were present in the corridors at classroom entries, and remaining areas of the building typically had gypsum board ceilings. A linear metal "t-bar" ceiling was observed in the corridor outside of the Front Office and entry area.

The building had an Exterior Insulation Finish System (EIFS) throughout the exterior. The EIFS is shown to have a gypsum board sheathing between it and the interior fiberglass batt insulation, however, this sheathing could not be verified by field observations.

The roofs were typically of sloped standing seam metal roof design from the original construction. At the bottom of the south-facing sloped roofs of the west wing and central core, flat roofing areas were present but could not be accessed due to extensive snow and ice accumulations and associated safety concerns at the time of the assessment. Based on the as-built drawings from the 2003 Roof Upgrades project, these flat roofing areas have EPDM membranes adhered to 1/2" OSB on top of insulation crickets of an unspecified type which are presumed to be of EPS insulation. The flat roofing areas were constructed on top of the original corrugated metal roof decking where the standing seam metal roof panels were cut back to accommodate the new roof design, however, the as-builts show that a self-adhering membrane was applied to the existing roof deck prior to constructing the new flat roof assembly.

On the north side of the building in the "receiving dock" area, another flat roof was present that could not be accessed due to extensive snow and ice accumulations and associated safety concerns at the time of the assessment. Based on the as-built drawings from the 2014 Roof Upgrades project, this flat roof area is made up of two different types of roofing assemblies. The first type, which is described as "Assembly A" on detail 7/A3 of the as-builts, has a surface EPDM membrane adhered to a 5/8" DensDeck cover board that is laid on top of a 10 mil polyethylene vapor retarder on a new corrugated metal roof deck. The second type, which is described as "Assembly B" on detail 7/A3 of the as-builts, has a surface EPDM membrane adhered to 5/8" DensDeck cover board that is mechanically fastened to taped insulation crickets presumed to be of EPS material over a 1/4" DensDeck board that is mechanically fastened to the new corrugated metal roof deck after a 10 mil polyethylene vapor retarder is installed.

Heating in the building was provided by a combination of boiler-fed baseboard heating elements and reheat coils located in the ventilation system. Boiler-fed unit heaters were also noted in the ceiling spaces of the building. Ventilation was provided by air handling units located in the building's fan rooms.

3. Project Summary

The project's main goals are to remove and replace the existing roofing assemblies and to correct issues relating to moisture and vapor control within the building roofing assemblies and exterior envelope. Refer to descriptions and narratives of other disciplines for detailed information on the overall scope of work for the project.

4. Inspector

Mr. Christopher T. Ottosen of HTRW, LLC performed the assessment and holds the following certifications: EPA-Certified AHERA Building Inspector, Management Planner, Project Designer, Asbestos Abatement Worker and Contractor/Supervisor, and EPA-Certified Risk Assessor. Mr. Ottosen is an Alaska Asbestos Abatement Certificate of Fitness Holder and has additional training from McCoy and Associates on the RCRA Hazardous Waste Regulations; Confined Space Entry Training; OSHA 10-Hour Training; and Radiation Safety Training. HTRW, LLC is an EPA-Certified Lead-Safe Firm. Documentation of these various certifications and training experience is available on request to HTRW, LLC.

5. Definitions

Auxiliary work: is intended to include all work that is not defined as a **major element** by this report. An example of **auxiliary work** includes work such as routing of new mechanical or electrical systems to areas outside of the **main work area(s)**.

Common hazardous building materials: for the purposes of this report is intended to include: asbestos-containing materials, lead-containing materials, mercury-containing materials, PCB-containing materials, ozone depleting substances (ODS), heat transfer fluids, and materials with radioactive components.

Main work area: is intended to include area(s) which have defined boundaries where the majority of work is located.

Major element: is intended to include the elements of work which are located within the **main work area(s)**, whose scope is not subject to variations in means or methods, and can generally be identified solely by graphical representation or notation on the contract drawings.

6. Scope of Assessment

The hazardous materials assessment performed by HTRW, LLC did not include inspection of the entire site or identification of all **common hazardous building materials** which may be present at the site, including certain **common hazardous building materials** not scheduled for disturbance which are located within the assessment boundaries. The assessment was focused on the identification of **common hazardous building materials** located within the **main work area(s)** which were scheduled for disturbance by the proposed Spring Hill Elementary School Roof Replacement Project and as agreed upon with our client. The assessment did include identification of **common hazardous building materials** located both inside and outside of the main work area boundaries that could potentially be disturbed by the scope of work, or for those materials which were likely to be contacted during the work based on the inspector's professional judgement. The information contained in this report is based mainly on the historical drawing information described below, observations made by the inspector at the site, the results of the limited sampling conducted, experience in other similar buildings, and from experiences with past projects of similar scope.

Prior to and after the assessment, HTRW, LLC reviewed available documentation for the site which aided in the development of a sampling and inspection strategy, as well as in the preparation of this report. HTRW, LLC reviewed the following information which was made available electronically:

- Historical drawing information:
 - Plats of the property dated 1982 and 1984.
 - A drawing from 1984 that is titled "Construction Network".
 - 1984 Lake Otis Parkway Street Improvements.
 - 1984 scans of logs for soils boring and pits.
 - 1984 Municipality of Anchorage Water & Wastewater Utility, Section 16 Water Facilities, 1983 Improvements, Pumping and Treating Facility, Storage Reservoir Erection.
 - 1985 Original Construction Drawings.
 - 1986 Computer Assisted / Industrial Alarms and Energy Management Systems.
 - 1987 Structural Upgrades and Corrections at Five Elementary Schools.
 - 1997 site plan by Chugach Computer Technologies.
 - 1997 floor plan by Omni Computer Center, Inc.
 - 2002 Power and Data Upgrades in Support of Technology.
 - 2003 Fire Alarm Upgrade As-Builts by Siemens.
 - 2003 Fire Detection and Alarm Replacement.
 - 2003 Roof Upgrades.
 - 2005 4 School HVAC Upgrade.

- 2005 Spring Hill Carpet Replacement.
- 2008 Handicap Access Improvements.
- 2009 Security Door Hardware Upgrades.
- 2010 Multi-site Data Closet Cooling.
- 2013 5-School Emergency Lighting/Standby Power.
- 2014 Boiler Replacement with missing Hazardous Materials Removal sheet.
- 2014 Roof Upgrades.
- 2018 Lighting Upgrades.
- 2022 Rubber Gym Floor Replacement Group 1.
- Other
 - 2012 Final Civil Site Assessment prepared by R&M Consultants, Inc.
 - Scans of the school's AHERA documentation.
 - 50% design drawings prepared by MCG Explore Design, and additional coordination documentation relevant to the proposed Roof Replacement project.

7. Asbestos

HTRW, LLC collected bulk samples of building materials at the site which were analyzed by Polarized Light Microscopy (PLM) using protocols defined in 40 CFR Appendix E to Subpart E of Part 763, interim method for the Determination of Asbestos in Bulk Insulation Samples; the United States Environmental Protection Agency (USEPA) Method 600, R93-116; and NYSDOH ELAP 198.1 as needed. PLM analysis is the “standard” analysis that is required by most agencies governing asbestos-related work, however, it is limited in its ability to identify smaller asbestos fibers due to the low magnification used by the analytical method, as well as for asbestos fibers which may be obscured by interfering matrices. A secondary analysis that may be performed at the discretion of the inspector to help aid in the analysis of these types of samples is called Transmission Electron Microscopy for Non-friable, Organically Bound (TEM-NOB) materials which uses protocols defined in ELAP Section 198.4. Several other analytical methods exist to determine the presence of asbestos in bulk samples of building materials, and those techniques may be used at the discretion of the building inspector.

The PLM and TEM-NOB samples were analyzed by International Asbestos Testing Laboratories (iATL) located at 9000 Commerce Parkway Suite B, Mt. Laurel, New Jersey 08054. Limited additional samples were analyzed by PLM by Alaska Asbestos Laboratory. These laboratories were accredited at the time of analysis by the National Institute of Standards and Technology (NIST) through the National Voluntary Laboratory Accreditation Program.

Refer to Appendix A and Appendix D for the following asbestos-related documentation:

Appendix A.1 - Table of Asbestos Samples

Appendix A.2 - Final Laboratory Certificate of Analysis & Chain of Custody

Appendix A.3 - Laboratory Accreditations

Appendix A.4 - Asbestos Inspector Certifications

Appendix D - Drawings of Asbestos and Lead Test Locations

A. Survey Results

Refer to the tables at the beginning of this report for a summary of the materials which were confirmed or assumed to contain asbestos by this or previous assessments, Appendix A.1 for a listing of samples collected for this project, and Appendix D for drawings of sample locations.

B. Discussion on Findings

Category I Nonfriable Asbestos-Containing Materials

The EPA defines Category I nonfriable asbestos-containing material as:

Asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy.

A summary of the types of Category I nonfriable asbestos-containing material identified in the buildings are shown in Appendix A.1 - Table of Asbestos Samples. The Category I nonfriable asbestos-containing materials were typically in good condition with isolated areas of "normal wear-and-tear" type damage unless noted otherwise below.

A discussion on the Category I nonfriable asbestos-containing materials known or assumed to be present at the site include:

- Miscellaneous asphaltic roof tars, mastics, and sealants on all roofing types and eras
 - The majority of the roofs were obscured by ice and snow accumulations at the time of the assessment, and therefore, not all areas of the roofs could be observed. This report assumes that asbestos-containing asphaltic roof tars, mastics, and sealants may have been used at miscellaneous locations of the roofs which are anticipated to be encountered at various patching attempts and at equipment and piping penetrations through the various roofing assemblies, including those from the 2003 and 2014 projects. If present, the materials will be removed as encountered during the work.
- Flange gaskets and Valve packings
 - Flange gaskets and valve packing on piping systems are assumed to contain asbestos. These materials typically cannot be sampled without disassembling components and typically vary widely in their composition in any given building based on which applications the materials are used with or when they were installed. Therefore, all flange gaskets and valve packing materials in this building are assumed to contain asbestos. No flange gaskets or valve packing materials are anticipated to be disturbed by this project.
- Flange gaskets on the generator exhaust and muffler
 - The flange gaskets used on the generator exhaust and muffler flanges were confirmed to contain asbestos. This material may require disturbance depending on the contractor's choice of means and methods to complete the work.
- Thin crispy black foundation dampproofing
 - The building's foundation walls were entirely obscured by large accumulations of snow and ice during the assessment, and therefore, the foundation walls could not be accessed for inspection or sampling. Sampling at other schools using the same prototypical design which were also built at approximately the same time has previously identified a black asbestos-containing dampproofing material on the below grade portions of the building's foundation walls. This report assumes that the same or similar material was used at this school which is further assumed to contain asbestos. This material will be disturbed to accommodate the structural upgrades work in the Art Classroom.
- Various colors and patterns of 12" x 12" vinyl floor tile
 - There were four different colors and patterns of 12" x 12" vinyl floor tiles noted at the building during a separate site visit in October 2023, and additional colors and patterns may be present which were not observed. Sampling data from a May 26, 2005 sampling event at the school collected samples of two different types of floor tile, however, it is unknown if those samples were collected from the floor tiles that are currently present at the school. That sampling also did not include analysis of the floor tiles by TEM NOB. Sampling of similar vinyl floor tiles at other schools which use the same prototypical design have been found to contain asbestos by TEM NOB analysis after the initial PLM analysis did not identify asbestos in the floor tiles. Therefore, this report assumes that all 12" x 12" vinyl floor tiles at the school contain asbestos

until additional sampling and analysis shows otherwise. No 12" x 12" vinyl floor tiles are anticipated to be disturbed by the scope of work for this project.

Category II Nonfriable Asbestos-Containing Materials

The EPA defines Category II nonfriable asbestos-containing material as:

Any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos as determined using the methods specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

A summary of the types of Category II nonfriable asbestos-containing material identified in the buildings are shown in Appendix A.1 - Table of Asbestos Samples. The Category II nonfriable asbestos-containing materials were typically in good condition with isolated areas of "normal wear-and-tear" type damage unless noted otherwise below.

A discussion on the Category II nonfriable asbestos-containing materials known or assumed to be present at the site include:

- Black flooring mastic
 - A black flooring mastic was used to adhere the 12" x 12" vinyl floor tiles to substrates at the building. Sampling data from a May 26, 2005 sampling event at the school collected two samples of a black flooring mastic that did not contain asbestos. That sampling also did not include analysis of the black flooring mastic by TEM NOB. Sampling of similar black flooring mastic at other schools which use the same prototypical design have been found to contain asbestos by TEM NOB analysis after the initial PLM analysis did not identify asbestos in the black flooring mastic. Therefore, this report assumes that the black flooring mastic at the school contains asbestos until additional sampling and analysis shows otherwise. No black flooring mastic is anticipated to be disturbed by the scope of work for this project.
- Sticky sealants used on seams, flashings, trim pieces, etc. throughout the standing seam metal roofing
 - At least four different colors of sticky sealants were observed on the standing seam metal roofing assemblies including grey and light grey colored sealants that were confirmed to contain asbestos and a dark red sealant that was confirmed to contain less than 1% asbestos. No asbestos was detected in a white sealant that was sampled. The sealants appear to have been used interchangeably between the differing roofing features, and therefore, delineation of the asbestos-containing in relation to non-asbestos-containing sealants was not possible. These sealants will be removed in their entirety by this project.
- Sealants on HVAC systems
 - Sampling data from a January 14, 2005 shows that the tan and grey sealants used on HVAC systems at the school were confirmed to contain asbestos. These sealants were noted on supply air systems, return air systems, some exhaust air systems, outside air intakes, and are assumed to be present on other associated mechanical systems that might be present at the school. These sealants were often concealed by duct tape for an unknown reason, and this report assumes that asbestos-containing sealants are present at all locations where there is duct tape on the HVAC systems. The sealants appeared to have been most commonly used at seams in the various systems but were also noted on duct flanges and at some of the crimped seams inside of the outside air intakes. Another type of grey sealant was confirmed to contain asbestos during the 2024 assessment, and that sealant was noted on the seams of the outside air intake duct as viewed through the exterior louvers and was also present on the bird screens in the louvers. These sealants are anticipated to be disturbed by the project to accommodate reconfiguration of the outside air and relief air intakes at the roof level.
- Lining of clock-speaker box housings, clock housings, and speaker housings
 - The styles of intercom and clock devices used at this school appear to have been different than those commonly found in the other schools using the same prototypical design. At the other prototypical schools, an asbestos-containing black tarry lining was commonly identified inside of wall-mounted clock-speaker boxes and inside of ceiling-mounted square and/or circular "red-can" speaker boxes. None of these styles

were observed at Spring Hill, and it is possible that these devices may not have a lining material or may have a different type of lining material. No wall-mounted clock-speaker boxes, ceiling-mounted speaker boxes, clock-only boxes, or circular exterior speaker boxes were opened for inspection for this project and are assumed to have an asbestos-containing lining material. None of these devices are anticipated to be disturbed by this project.

- Various colors of undercoatings on the bottom of stainless steel sinks and drinking fountains
 - At least four different styles of stainless steel sinks and one style of stainless steel drinking fountain were noted during an October 2023 assessment at the school which were typically coated with a black undercoating material on the bottom of the sink. This type of material commonly contains asbestos in most pre-2000 construction and is assumed to contain asbestos at this building. No stainless steel sinks or drinking fountains are anticipated to be disturbed by this project.
- Grouts, mastics, and mortars for ceramic mosaic floor tiles and wall bases
 - Various colors and sizes of ceramic mosaic floor tiles and wall bases are present at the school, and this report assumes that these used asbestos-containing grouts, mastics, and mortars. None of these materials are scheduled for disturbance by this project.
- Various materials used inside of electrical enclosures
 - Based on recent experience in other facilities, there appear to have been a large number of electrical enclosures used with various types of asbestos-containing materials such as insulators, spark shields, and other purposes. These types of enclosures are typically not accessible during assessments due to energized circuitry. Therefore, this report assumes that all electrical enclosures have one or more types of asbestos-containing materials concealed within the enclosures. There does not appear to be any work that will affect these types of materials based on the design documents.

Regulated Asbestos-Containing Materials

The EPA defines regulated asbestos-containing materials (RACM) as:

Friable asbestos material; Category I nonfriable ACM that has become friable; Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; or Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by this subpart.

A summary of the types of RACM identified in the buildings are shown in Appendix A.1 - Table of Asbestos Samples. The RACM materials were typically in good condition with isolated areas of “normal wear-and-tear” type damage unless noted otherwise below.

A discussion on the RACM materials known or assumed to be present at the site include:

- Insulating materials inside of doors
 - Doors throughout the building are assumed to contain asbestos-containing insulating materials. The insulation of fire doors is concealed within the door and is not accessible unless the door is damaged. Destructive examination of the doors is not recommended as it can potentially void the fire rating of the door and cause a pathway for exposure to an otherwise inaccessible material, however, if doors are damaged and any internal materials visible, the material could be sampled.

Materials Containing Less Than or Equal to One Percent Asbestos

Materials which contain less than or equal to 1% asbestos are not classified as an asbestos-containing material by the EPA or OSHA, and these materials are not regulated for disposal by the EPA. However, OSHA regulations under 29 CFR 1926.1101 still apply to workers involved in the disturbance of materials containing $\leq 1\%$ asbestos. Materials at the site which were found to contain $\leq 1\%$ asbestos include:

- Light grey spongy sealant commonly used with the EPDM-like membranes used at VTR penetrations and below the clerestory and louver “walls”
 - A light grey spongy-like sealant was commonly used on various roofing features in conjunction with EPDM-like membranes at VTR penetrations and below the clerestory and louver “walls”, and that material was confirmed to contain less than 1% asbestos by TEM NOB analysis. This material will be removed in its entirety by this project.
- Hard black gasket and associated black sticky gum-like sealant used between the wire glass clerestory glazing and the metal window casing
 - The wire glass clerestory windows used a hard black gasket material in conjunction with a black sticky gum-like sealant, and each of these materials were confirmed to contain asbestos at less than 1% by TEM NOB analysis. These types of sealants may also be present at other windows at the facility, and additional sampling should be performed on other windows should they require disturbance. The glass clerestory windows will be demolished by this project.
- Off-white gum-like putty used at duct flanges of supply air, return air, and outside air systems
 - Some of the duct flanges on the supply air, return air, and outside air systems used and off-white gum-like putty that was confirmed to contain less than 1% asbestos by TEM NOB analysis. The putty is not anticipated to be disturbed by this project but may be disturbed at the outside air intake ductwork depending on the contractor’s choice of means and methods to complete the work.

Other Asbestos-Containing Materials

Some components, typically mechanical equipment, may contain several different types of materials that fall into one or more of the three categories. The other asbestos-containing materials known or assumed to be present at the site include:

- Standby generator gaskets, sealants, and insulating materials
 - The standby generator assembly is assumed to have various asbestos-containing gaskets, sealants, and possibly insulating materials. The generator assembly is not anticipated to be affected by this project.

As discussed elsewhere in this report, not all areas of the site were inspected, and not all materials were sampled or identified. This report assumes that additional asbestos-containing materials may be present. Any work which will disturb existing building materials that have not been shown to not contain asbestos must be performed by trained asbestos workers unless representative sampling performed by qualified persons shows otherwise.

C. Regulatory Discussion

Asbestos-related work is a highly regulated industry, and the assessment performed by HTRW, LLC was partially intended to identify asbestos-containing materials so that the health and safety requirements of various governing agencies as they relate to asbestos work could be satisfied. A partial listing of applicable public laws, statutes, and regulations include:

- Occupational Safety and Health Administration:
 - 29 CFR 1910.134 – Respiratory Protection
 - 29 CFR 1910.1001 – Asbestos in General Industry
 - 29 CFR 1910.1200 – Hazard Communication
 - 29 CFR 1926.33 – Access to Employee Exposure and Medical Records
 - 29 CFR 1926.55 – Gases, Vapors, Fumes, Dusts, and Mists

- 29 CFR 1926.59 – Hazard Communication
- 29 CFR 1926.103 – Respiratory Protection
- 29 CFR 1926.1101 – Asbestos in Construction
- United States Environmental Protection Agency:
 - 40 CFR Part 61, Subpart A – General Provisions
 - 40 CFR Part 61, Subpart M – National Emission Standard for Asbestos
 - 40 CFR Part 763 – Asbestos
- United States Department of Transportation:
 - 49 CFR Part 107 – Hazardous Materials Program Procedures
 - 49 CFR Part 171 – General Information, Regulations, and Definitions
 - 49 CFR Part 172 – Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans
 - 49 CFR Part 173 – Shippers- General Requirements for Shipments and Packagings
- Alaska Statutes:
 - AS Section 18.31 – Asbestos
 - AS Section 18.60 – Safety
 - AS Section 18.62 – Certificates of Fitness
 - AS Section 23.05 – Department of Labor and Workforce Development
- Alaska Administrative Code:
 - 8 AAC 61 – Occupational Safety and Health Division
 - 8 AAC 61.600-790 – Asbestos Abatement Certification
 - 8 AAC 61.1010-1190 – Occupational Safety and Health Standards
 - 18 AAC 60 – Solid Waste Management
 - 18 AAC 60.450 – Asbestos Disposal Regulations
 - 18 AAC 62 – Hazardous Waste
 - 18 AAC 70 – Water Quality Standards
 - 18 AAC 72 – Wastewater Treatment and Disposal
 - 18 AAC 75 – Oil and Other Hazardous Substances Pollution Control

The removal and disposal of materials containing asbestos is regulated in different ways by different regulatory agencies. The main difference which drives which regulations apply is whether the affected areas are classified as a “school building” as defined by 40 CFR 763.83. 40 CFR 763 Subpart E, Asbestos-Containing Materials in Schools, is commonly referred to as “AHERA” and contains several requirements specific to “school buildings” which may not be required in other types of buildings. Specific requirements for facilities meeting the definition of a “school building” include the requirement to designate persons to ensure the requirements of the regulation are properly implemented, requires initial and periodic inspections, the development and maintenance of an asbestos management plan, specifies training requirements, annual notification requirements, recordkeeping and labeling requirements, clearance air sampling, among other requirements unique to “school buildings”. Although these requirements are specific to “school buildings”, many of the same requirements are commonly required by contracts.

Three of the other main asbestos regulations which govern asbestos-related work in most facilities, including schools, include 29 CFR 1926.1101 for worker protection, 40 CFR 61 Subpart M for inspection and disposal requirements related to renovation and demolition activities, and Title 49 CFR, Subtitle B, Chapter I, Subchapter C (DOT, Hazardous Materials Regulations 49 CFR Parts 171-185) for the transportation of materials containing asbestos.

D. Conclusions and Recommendations

The disturbance and disposal of asbestos-containing materials are subject to regulation by the agencies described above among others. All asbestos-related work must be performed in accordance with all applicable laws whether they are referenced within this report or not.

8. Lead

HTRW, LLC tested painted materials and other materials suspected of containing lead at miscellaneous locations throughout the project areas. Tests were performed using a SciApps X-550 X-Ray Fluorescence (XRF) analyzer with serial number 00528. Testing by XRF is a non-destructive and near instantaneous test method capable of determining the lead content of various materials. The XRF used by HTRW, LLC is approved by the EPA for use in Lead Inspections in accordance with the instrument's Performance Characteristic Sheet (PCS).

The XRF testing performed by HTRW, LLC did not include the testing of all surfaces and materials in the building and was not intended to satisfy any specific regulatory requirement. The intent of the testing was to screen for potential lead-containing paints and materials at the site. The assessment did not include testing or identification of all paints and materials in the building, and additional sampling may be required to determine the applicability of 29 CFR 1910.1025 and/or 29 CFR 1926.62.

Additionally, this building was constructed after 1978 and is not classified as a child occupied facility in accordance with 40 CFR 745, and therefore, is not regulated by 40 CFR 745.

Refer to Appendix B and Appendix D for the following lead-related documentation:

Appendix B.1 - Table of XRF Readings

Appendix B.2 - Lead Inspector Certifications

Appendix D - Drawings of Asbestos and Lead Test Locations

A. Survey Results

Refer to the tables at the beginning of this report for a summary of the materials which were confirmed or assumed to contain lead by this or previous assessments, Appendix B.1 for the results of the XRF testing, and Appendix D for drawings of sample locations.

B. Discussion on Findings

The concentrations of lead found in painted surfaces varied from trace amounts to 0.189 mg/cm². Most paints had relatively low lead concentrations. Paints observed at the site were typically in good condition.

Lead concentrations in solder were found up to 0.336 mg/cm², and it is assumed that there is solder with similar and/or higher lead concentrations throughout the building.

Metallic lead components identified at the building include solder on copper piping noted above, poured lead sealants at bell and spigot pipe connections, and inside of lead-acid batteries.

Lead-containing glazings were assumed to be present on ceramic/porcelain wall tiles, floor tiles, sinks, toilets, and urinals.

Lead-containing "Formica" laminate panels were identified on countertops and cabinetry.

Other miscellaneous lead-containing materials identified at the building include plastic and vinyl products.

Due to the age of the building and the lead concentrations found during the limited lead testing, all painted, glazed, laminated, or otherwise coated surfaces should be considered lead-containing unless further testing shows otherwise. XRF technology cannot currently classify paints and other materials as "lead-free" for the purposes of determining if 29 CFR 1926.62 applies, and therefore, additional sampling of materials may be required.

C. Regulatory Discussion

Lead-related work is a highly regulated industry, and the assessment performed by HTRW, LLC was partially intended to identify lead-containing materials so that the health and safety requirements of various governing agencies as they relate to lead work could be satisfied. A partial listing of applicable public laws, statutes, and regulations include:

- Occupational Safety and Health Administration:
 - 29 CFR 1910.120 – Hazardous Waste Operations and Emergency Response
 - 29 CFR 1910.134 – Respiratory Protection
 - 29 CFR 1910.1000 – Air Contaminants
 - 29 CFR 1910.1025 – Lead in General Industry
 - 29 CFR 1910.1200 – Hazard Communication
 - 29 CFR 1926.62 – Lead in Construction
 - 29 CFR 1926.65 – Hazardous Waste Operations and Emergency Response
- United States Environmental Protection Agency:
 - 40 CFR 260 – Hazardous Waste Management System: General
 - 40 CFR 261 – Identification and Listing of Hazardous Waste
 - 40 CFR 262 – Standards Applicable to Generators of Hazardous Waste
 - 40 CFR 263 – Standards Applicable to Transporters of Hazardous Waste
 - 40 CFR 264 – Standards for Owners and Operators of Hazardous Waste Treatment, Storage, And Disposal Facilities
 - 40 CFR 265 – Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, And Disposal Facilities
 - 40 CFR 266 – Standards for The Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
 - 40 CFR 267 – Standards for Owners and Operators of Hazardous Waste Facilities Operating Under a Standardized Permit
 - 40 CFR 268 – Land Disposal Restrictions
 - 40 CFR 270 – EPA Administered Permit Programs: The Hazardous Waste Permit Program
 - 40 CFR 271 – Requirements for Authorization of State Hazardous Waste Programs
 - 40 CFR 272 – Approved State Hazardous Waste Management Programs
 - 40 CFR 273 – Standards for Universal Waste Management
 - 40 CFR 745 Lead-Based Paint Poisoning Prevention in Certain Residential Structures
- United States Department of Transportation:
 - 49 CFR Part 107 – Hazardous Materials Program Procedures
 - 49 CFR Part 171 – General Information, Regulations, and Definitions
 - 49 CFR Part 172 –Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans
 - 49 CFR Part 173 – Shippers- General Requirements for Shipments and Packagings
- Alaska Statutes:
 - AS Section 18.60 – Safety
 - AS Section 18.62 – Certificates of Fitness
 - AS Section 18.63 – Hazardous Painting Certification
 - AS Section 23.05 – Department of Labor and Workforce Development
- Alaska Administrative Code:
 - 8 AAC 61 – Occupational Safety and Health Division
 - 8 AAC 61.800-890 – Painting Certification
 - 8 AAC 61.1010-1190 – Occupational Safety and Health Standards
 - 18 AAC 60 – Solid Waste Management

- 18 AAC 62 – Hazardous Waste
- 18 AAC 70 – Water Quality Standards
- 18 AAC 72 – Wastewater Treatment and Disposal
- 18 AAC 75 – Oil and Other Hazardous Substances Pollution Control

The disturbance of lead-containing materials is subject to regulation by 29 CFR 1910.1025 and 29 CFR 1926.62. Which regulation governs depends on whether the planned work is classified as construction work or as other work in accordance with OSHA regulations. OSHA's lead regulations do not limit the definition of lead-containing materials to only "paints" and generally include any material containing lead. Similarly, OSHA's lead regulations do not specify a threshold to determine whether a material is considered to be lead-containing or not. OSHA has instead released several formal letters of interpretation which indicate that the scope of the regulation is intended to protect persons from occupational exposure to lead, and therefore, the regulations apply to any material containing lead at any concentration. OSHA's lead regulations contain "trigger tasks" which establish presumptive exposure limits for progressively higher-risk tasks, and those "trigger tasks" form the basis of the employer's initial and ongoing obligations and responsibilities to ensure employees are protected from lead exposure. Each project is unique, and the extent to which the work is regulated must be determined on a case-by-case basis. It is the Owner's and/or contractor's responsibility to review the "trigger tasks" and other requirements of 29 CFR 1910.1025 or 29 CFR 1926.62 to determine which portions apply, if any, to each unique work task required by the project.

Disturbance of paints classified as "lead-based" is subject to regulation by 40 CFR 745, and which portions of the regulation govern depends on whether the planned work is classified as "abatement" as defined by 40 CFR 745.223 (a). Construction projects generally do not meet the definition of "abatement" work and will typically be considered a "Renovation, Repair, or Painting" (RRP) activity under the regulation and would therefore be regulated by 40 CFR 745 Subpart E – Residential Property Renovation. Projects meeting the definition of "abatement" are regulated by 40 CFR 745 Subpart L – Lead-Based Paint Activities.

After establishing which regulation is applicable to the work, the degree to which the work is regulated depends on numerous factors and must be determined on a case-by-case basis. The main pertinent factors include: when was the facility constructed, what age groups occupy the building, where in the building are those groups located, what is the duration of occupancy for the age groups, are lead-based paints known or assumed to be present, and what quantity of lead-based paint will be disturbed in each area. It is the Owner's and/or contractor's responsibility to review the requirements of 40 CFR 745 to determine which portions apply, if any, to each unique work task required by the project.

The disposal of lead-containing materials is regulated by the EPA, and the extent to which disposal is regulated depends mainly on the type of waste being disposed of and whether the waste is classified as a hazardous or non-hazardous waste in accordance with 40 CFR 261. Typical lead-containing wastes generated during construction projects include, but are not limited to, construction and demolition debris wastes which contain lead, metallic lead wastes, and Universal Waste lead-acid batteries.

All wastes meeting the definition of a "solid waste" as defined by 40 CFR 261.2 must have a hazardous waste determination in accordance with 40 CFR 261 to further characterize the wastes as hazardous or non-hazardous. The regulations contain many exclusions and other criteria for defining a solid waste, however, for the purposes of this report that definition may be thought of as any waste generated during the course of the construction project.

Construction and demolition debris wastes which contain lead must be TCLP tested in accordance with 40 CFR 261. The results of the TCLP will determine whether the waste stream is characterized as a hazardous or non-hazardous waste for lead, and thus, how those wastes must be managed. There are many factors which can influence the TCLP testing results, such as what lead-containing materials are present in the waste stream, the condition of those materials, how the waste streams are segregated, the total proportion of lead-containing wastes to each individual waste stream, sample selection, among others. Based on studies performed by the United States Army and prior review of TCLP testing results, most construction and demolition debris waste streams are not likely to be classified

as a hazardous waste for lead when the waste stream for the entire project is considered. Waste streams which contain relatively large quantities of materials containing high levels of lead or waste streams in which the lead-containing wastes are disproportionately segregated are more likely to be classified as a hazardous waste.

Metallic lead or components with metallic lead by themselves would likely be classified as a hazardous waste. However, these types of wastes can typically be recycled, and the hazardous waste regulations provide an exemption to these wastes as long as they are recycled and managed in accordance with 40 CFR 261.

Lead-acid batteries contain metallic lead and corrosive liquids which are both considered hazardous wastes by 40 CFR 261. However, lead-acid batteries may be managed as a Universal Waste in accordance with 40 CFR 273.

D. Conclusions and Recommendations

The disturbance and disposal of lead-containing paints and other materials are subject to regulation by the agencies described above among others. All lead-related work must be performed in accordance with all applicable laws whether they are referenced within this report or not.

9. Other Common Hazardous Building Materials

Other *common hazardous building materials* include mercury-containing materials, PCB-containing light ballasts, Ozone Depleting Substances (ODS), materials with radioactive components, and heat transfer fluids.

A. Mercury

The assessment included inspection for components suspected of containing mercury, but no sampling of materials suspected of containing mercury was conducted as part of the assessment.

a. Survey Results

Refer to the tables at the beginning of this report for a summary of the materials which were confirmed or assumed to contain mercury by this or previous assessments.

b. Discussion on Findings

All fixtures observed at the building had LED lights, but mercury-containing lamps may be present in isolated areas of the building, such in desktop light fixtures or miscellaneous abandoned fixtures. Similarly, mercury-containing equipment was not observed but may also be present.

Poured polyurethane floors commonly found in multi-purpose rooms, gymnasiums, and other athletic facilities may contain elemental mercury in concentrations exceeding regulatory thresholds for hazardous wastes. Phenylmercuric Acetate (PMA) was historically used as a catalyst in certain formulations of these types of floors, and studies have demonstrated that areas with floors which used PMA consistently have mercury vapor concentrations exceeding local background concentrations of mercury vapor. Based on currently available studies, there is no apparent consensus on which manufacturers used PMA in their formulations or during which timeframes PMA was most commonly used.

The concentrations of mercury vapor in areas which used PMA have been shown by several studies to vary greatly due to many factors such as: the overall mercury content of the floor, the floor's condition, the floor's age, the total surface area of the floor, the total volume of the space where the floor is located, temperature, ventilation system design, ventilation rate, the types of activities occurring in the space and their frequency, among others. Generally speaking, increases in the overall mercury content of the floor, damage to the floor, the surface area of the floor, the temperature, and activities in the space will tend to result in increases to mercury vapor concentrations. Conversely, increases in the age of the floor, the volume of the space where the floor is located, and ventilation rates will tend to result in reductions to mercury vapor concentrations. Because many variables, such as the age of the

floor or volume of the space, are difficult or impossible to control by either administrative or engineering controls, most studies agree that controlling and maintaining temperature and adequate ventilation to an area is the most effective way to reduce mercury vapor concentrations while the flooring remains in place.

The flooring in the Gym appeared newer during the February 2024 assessment and is assumed to have been replaced as part of the Rubber Gym Floor Replacement, Group 1 project which is believed to have taken place during the summer of 2022. The flooring material which was present in the Gym prior to that project was reported to have contained mercury in concentrations high enough to be classified as a hazardous waste.

Based on the sampling data found in the ITB documents for the Rubber Gym Floor Replacement, Group 1 project, one sample of the poured polyurethane flooring in the Gym was previously collected and was analyzed for total mercury content using EPA Method SW-846-7174B. Additional analysis for leachable mercury using the Toxicity Characteristic Leaching Procedure (TCLP) was performed using EPA Method 7470A. The total mercury content of the flooring sample was reported as 96 mg/Kg (milligrams of mercury per Kilogram of analyte) of mercury. The amount of leachable mercury of the flooring was reported as 0.40 mg/L (milligrams of mercury per Liter of leachate) of mercury. Based on these results, the flooring was classified as a Low Mercury Subcategory hazardous waste in accordance with 40 CFR 261.

As a poured floor, it is assumed to have penetrated into porous surfaces, including the concrete block walls and poured concrete floor slab in the Gym. It is unknown what level of cleaning was required by the past project or if any of the flooring material was removed from the porous substrates. If removed, it is unknown if the remaining substrates were sampled to determine if they were free of mercury or contained mercury at concentrations less than the criteria for hazardous waste. The flooring material, and/or remnants of, are not anticipated to be disturbed by this project.

c. Regulatory Discussion

Mercury is commonly found in fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps; in mercury-containing equipment such as thermostats, controls, and switches; and in poured rubber-like polyurethane flooring. These materials are regulated in different ways depending on the amount of mercury present, the condition of the components which contain mercury, and the quantity of mercury-containing materials being removed.

Materials which contain greater than 0.2 mg/L of mercury by TCLP testing are classified as a hazardous waste by the EPA and DOT and are subject to special packaging, labeling, disposal, transportation, and documentation requirements in accordance with Title 40 CFR, Chapter I, Subchapter I (EPA, Solid Wastes regulations 40 CFR 239-299) and Title 49 CFR, Subtitle B, Chapter I, Subchapter C (DOT, Hazardous Materials Regulations 49 CFR Parts 171-185).

Components such as lamps and thermostats can typically be classified as a hazardous waste based on visual inspection, either by cross referencing manufacturer labels on lamps to the testing results published by the manufacturer, or due to the visible presence of elemental mercury. Similarly, some lamps can be classified as a non-hazardous waste by cross referencing manufacturer labels on lamps to the testing results published by the manufacturer. The use of lamps with “green tip” or “eco” labels does not guarantee that the lamps do not contain mercury above regulatory thresholds for hazardous wastes, and all bulbs must be inspected to determine whether they are classified as a hazardous waste or not.

Mercury-containing lamps and equipment may alternatively be managed as a Universal Wastes in accordance with 40 CFR 273. The purpose of the Universal Waste regulations is to streamline the hazardous waste management standards for certain categories of hazardous waste that are commonly generated by a wide variety of establishments by promoting the collection and recycling of Universal Waste, easing the regulatory burden on retail stores and other generators that wish to collect these wastes and transporters of these wastes, and to encourage the development of municipal and commercial programs to reduce the quantity of these wastes going to municipal

solid waste landfills or combustors. However, the EPA does not require that mercury-containing lamps or equipment be managed as Universal Wastes, and these types of wastes may be managed as hazardous waste if the generator desires.

As stated above, materials which contain greater than 0.2 mg/L of mercury by TCLP testing are classified as a hazardous waste by the EPA and are subject to special packaging, labeling, disposal, transportation, and documentation requirements. The EPA further categorizes mercury-containing hazardous wastes into eight different subcategories, of which, poured polyurethane flooring materials will typically fall under one of two subcategories. The first subcategory is the High Mercury-Inorganic Subcategory which includes materials that contain greater than or equal to 260 mg/Kg of total mercury. The second subcategory is the Low Mercury Subcategory which includes materials that contain less than 260 mg/Kg of total mercury. Flooring which falls in the High Mercury-Inorganic Subcategory requires special treatment prior to disposal and will therefore generally increase disposal costs.

Refer to paragraph F Regulatory References below for a partial listing of applicable regulations.

d. Conclusions and Recommendations

The disturbance and disposal of mercury-containing materials are subject to regulation by the agencies described above among others. All mercury-related work must be performed in accordance with all applicable laws whether they are referenced within this report or not.

B. PCB-Containing Materials

The assessment did not include inspection of lighting fixtures for possible PCB ballasts, nor did it include sampling of any materials to determine if those materials contained PCBs. Based on the age of the building, PCB-containing materials should not have been used, however, this building may have PCB-containing building materials which may be affected by the project scope of work which may be regulated for disposal by Alaska Department of Environmental Conservation regulations issued under Title 18 of the Alaska Administrative Code.

a. Survey Results

Refer to the tables at the beginning of this report for a summary of the materials which were confirmed or assumed to contain PCBs by this or previous assessments.

b. Discussion on Findings

No PCB-containing light ballasts, materials, or apparent contamination are anticipated to be encountered at this school.

Polychlorinated Biphenyls (PCBs) were once widely used for various industrial and commercial applications such as in electrical equipment, heat transfer equipment, and hydraulic equipment; as a plasticizer in paints, plastics, and rubber products; as pigments and dyes for carbonless copy paper; among other industrial applications. The manufacturing and use of PCBs at certain concentrations was banned for most products in 1979 by the EPA. Stocks of supplies could be used after this date, and many PCB-containing materials are known to have been used after 1979.

Paints and caulking are two materials that commonly contain PCBs, and it is possible that PCB-containing paints and caulking are present at this site. Other common materials that have historically been shown to contain PCBs include printed circuit boards and attached components like transistors and capacitors, hydraulic fluids, oils, wire and cable insulation, plastic products, fiberglass, felt, foams, cork, miscellaneous adhesives and tapes, flooring products, among many other less-common building-related uses.

c. Regulatory Discussion

Materials which contain PCBs are regulated in different ways which depends mainly on what concentrations and types of PCBs are present, what physical form the PCBs are in, what components the PCBs were used in, and how the PCB wastes were generated. The transportation and disposal of PCBs are regulated by the EPA, DOT, the Alaska Department of Environmental Conservation, and the Alaska Department of Transportation and Public Facilities and are subject to special packaging, labeling, disposal, transportation, and documentation requirements in accordance with 40 CFR 761; Title 49 CFR, Subtitle B, Chapter I, Subchapter C (DOT, Hazardous Materials Regulations 49 CFR Parts 171-185); 17 AAC 25, 18 AAC 60.

Under federal regulations found at 40 CFR 761.62, certain materials meeting the definition of "PCB Bulk Product waste" may be disposed of "in a facility permitted, licensed, or registered by a State as a municipal or non-municipal non-hazardous waste landfill". Most PCB wastes generated by renovation or demolition activities at buildings will fall under the classification of a "PCB Bulk Product waste" which would allow for disposal at a non-TSCA landfill. However, based on guidance from the Alaska DEC and their interpretation of the Alaska Administrative Code, no PCB wastes exceeding 1 mg/Kg of total PCBs are currently allowed to be disposed of at any location in Alaska.

According to the Alaska DEC's interpretation of the Alaska Administrative Code, landfill owners and operators are obligated to prohibit the disposal of wastes containing PCBs in accordance with 18 AAC 60.240, and this is accomplished mainly by implementing "a program at the facility to detect and prevent the disposal of regulated hazardous waste and PCB waste as defined in 40 C.F.R. 761.3". Although there is no specific requirement for a landfill owner or operator to sample materials to determine the presence or concentration of PCBs under 18 AAC 60.240, because it is not possible to determine the presence or concentrations of PCBs by visual means, it is the DEC's interpretation that sampling is thus an inferred requirement under the AAC. Additionally, guidance from the Alaska DEC provides that building wastes could potentially be classified as "polluted soil" by 18 AAC 60.990(103)(B) "a residue or other material that is placed into a landfill and that is not a regulated hazardous waste but contains a hazardous substance in a concentration exceeding the applicable soil cleanup levels set out in 18 AAC 75.341, Table B1 or Table B2". Table B1 in 18 AAC 75.341 shows the soil cleanup levels for PCBs as 1.0 mg/kg, and therefore, this is the criteria which has been used by this report to determine the applicability of Alaska DEC regulations to the wastes.

Additionally, landfill owners and operators may set more stringent criteria than either Alaska DEC or EPA requirements. This report assumes that waste which may be accepted for disposal at landfills located within Alaska to be less than 1.0 mg/kg of total PCBs, and that waste equaling or exceeding 1.0 mg/kg of total PCBs will be disposed of at a landfill permitted and willing to accept the wastes located somewhere in the Pacific Northwest.

Refer to paragraph F Regulatory References below for a partial listing of applicable regulations.

d. Conclusions and Recommendations

The disturbance and disposal of PCB-containing materials are subject to regulation by the agencies described above among others. All PCB-related work must be performed in accordance with all applicable laws whether they are referenced within this report or not.

C. Ozone Depleting Substances

The assessment included a visual inspection of a limited number of components in the building to determine if ODS were present in the project areas.

a. Survey Results

Refer to the tables at the beginning of this report for a summary of the materials which were confirmed or assumed to contain ODS by this or previous assessments.

b. Discussion on Findings

Equipment with ODS were present at the site in refrigerators and commercial refrigeration equipment, however, no equipment with ODS were observed in the project areas. Formulations of ODS at the site are assumed to include both Class I and Class II ODS. No air conditioning equipment was noted during the assessment but may be present.

c. Regulatory Discussion

Ozone Depleting Substances (ODS) are broadly categorized by the EPA as either Class I ODS or Class II ODS. Class I ODS have an ozone depletion potential of 0.2 or higher, and include halons, chlorofluorocarbons (CFCs), methyl chloroform, carbon tetrachloride, and methyl bromide. Class I ODS have been subject to an accelerated phaseout schedule by the EPA. Class II ODS have an ozone depletion potential less than 0.2 and are all hydrochlorofluorocarbons (HCFCs). Class II ODS were typically developed as replacements to Class I ODS and have a later phaseout schedule than Class I ODS.

All ODS work must be performed by personnel who have passed an EPA-approved test for certification under 40 CFR 82.161. There are four types of certifications available under 40 CFR 82.161: Type I is required for persons servicing small appliances; Type II is required for servicing or disposing of high- or very high-pressure appliances, except small appliances and MVACs (Motor Vehicle Air Conditioning); Type III is required for servicing or disposing of low-pressure appliances; and Universal technician certification and allows for servicing all types of equipment. Servicing of motor vehicle air conditioning systems requires training and certification in accordance with 40 CFR 82 Subpart B which is generally not needed for building systems and components.

Refer to paragraph F Regulatory References below for a partial listing of applicable regulations.

d. Conclusions and Recommendations

The disturbance and disposal of ODS are subject to regulation by the agencies described above among others. All ODS-related work must be performed in accordance with all applicable laws whether they are referenced within this report or not.

D. Components with Radioactive Materials

The assessment included a visual inspection of a limited number of components in the building to determine if radioactive materials were present.

a. Survey Results

Refer to the tables at the beginning of this report for a summary of the materials which were confirmed or assumed to contain radioactive materials by this or previous assessments.

b. Discussion on Findings

Self-illuminating exit signs were observed throughout the building, and smoke detectors with radioactive components were not observed but may be present in building.

c. Regulatory Discussion

Certain components in buildings have been historically known to contain radioactive elements, such as self-illuminating exit signs with a radioactive form a hydrogen called tritium, and smoke detectors with americium-241, radium-226, or nickel-63. These components are considered safe when intact and used in accordance with the manufacturer's instructions and may typically be removed without special training. However, the transportation and disposal of components with radioactive elements is regulated by the Nuclear Regulatory Commission (NRC) under Title 10 CFR, Chapter I (10 CFR Parts 1-199) and is typically performed by returning the components to the manufacturer or other firm licensed by the NRC to accept radioactive wastes.

Refer to paragraph F Regulatory References below for a partial listing of applicable regulations.

d. Conclusions and Recommendations

The disturbance and disposal of radioactive materials are subject to regulation by the agencies described above among others. All radioactive materials-related work must be performed in accordance with all applicable laws whether they are referenced within this report or not.

E. Heat Transfer Fluids

The assessment included a limited visual inspection of heating system components in the building to determine what types of heat transfer fluids were present.

a. Survey Results

Refer to the tables at the beginning of this report for a summary of the materials which were confirmed or assumed to contain heat transfer fluids by this or previous assessments.

b. Discussion on Findings

The existing heating system at the building uses a heat transfer fluid of unknown formulation which is assumed to not be classified as a hazardous waste. The existing heating system is not anticipated to require disturbance by this project.

c. Regulatory Discussion

Heating and cooling systems in buildings (and generators) may contain heat transfer fluids which are potentially classified as a hazardous waste or other special waste category. These systems typically use various formulations of glycols or water and other additives in order to achieve the desired performance characteristics. Some types of heat transfer fluids may be classified as a hazardous waste or other special waste category based on the original formulation. Additionally, heat transfer fluids are subject to variations in temperature, pH, velocity, age, among other variables which can alter the chemistry of the fluids in unpredictable ways. Due to these variations, heat transfer fluids must have a hazardous waste determination performed prior to disposal in accordance with 40 CFR 261. This determination includes collecting a representative sample of the heat transfer fluids which will be disposed of and having a TCLP test performed on the sample. The TCLP test must include analysis for the RCRA 8 metals at a minimum, and corrosivity must also be determined. Additional testing may be required due to unique circumstances of any particular heating and cooling system.

Based on available data, heat transfer fluids are not typically classified as a hazardous waste, and if recycled, are typically exempt from the hazardous waste regulations.

Refer to paragraph F Regulatory References below for a partial listing of applicable regulations.

d. Conclusions and Recommendations

The disturbance and disposal of heat transfer fluids are subject to regulation by the agencies described above among others. All work involving heat transfer fluids must be performed in accordance with all applicable laws whether they are referenced within this report or not.

F. Regulatory References

Work involving the removal and disposal of **common hazardous building materials** is a highly regulated industry, and the assessment performed by HTRW, LLC was partially intended to identify those **common hazardous building materials** so that the health and safety requirements of various governing agencies as they relate to those materials could be satisfied. A partial listing of applicable public laws, statutes, and regulations include:

- Nuclear Regulatory Commission:
 - 10 CFR 20 – Standards for Protecting Against Radiation
- Occupational Safety and Health Administration:
 - 29 CFR 1910.120 – Hazardous Waste Operations and Emergency Response
 - 29 CFR 1910.134 – Respiratory Protection
 - 29 CFR 1910.1000 – Air Contaminants
 - 29 CFR 1910.1200 – Hazard Communication
 - 29 CFR 1926.55 – Gases, Vapors, Fumes, Dusts, and Mists
 - 29 CFR 1926.57 – Ventilation
 - 29 CFR 1926.65 – Hazardous Waste Operations and Emergency Response
 - 29 CFR 1926.95 – Criteria for Personal Protective Equipment
 - 29 CFR 1926.353 – Ventilation and Protection in Welding, Cutting, and Heating
- United States Environmental Protection Agency:
 - 40 CFR 82 – Protection of Stratospheric Ozone
 - 40 CFR 260 – Hazardous Waste Management System: General
 - 40 CFR 261 – Identification and Listing of Hazardous Waste
 - 40 CFR 262 – Standards Applicable to Generators of Hazardous Waste
 - 40 CFR 263 – Standards Applicable to Transporters of Hazardous Waste
 - 40 CFR 264 – Standards for Owners and Operators of Hazardous Waste Treatment, Storage, And Disposal Facilities
 - 40 CFR 265 – Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, And Disposal Facilities
 - 40 CFR 266 – Standards for The Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
 - 40 CFR 267 – Standards for Owners and Operators of Hazardous Waste Facilities Operating Under a Standardized Permit
 - 40 CFR 268 – Land Disposal Restrictions
 - 40 CFR 270 – EPA Administered Permit Programs: The Hazardous Waste Permit Program
 - 40 CFR 271 – Requirements for Authorization of State Hazardous Waste Programs
 - 40 CFR 272 – Approved State Hazardous Waste Management Programs
 - 40 CFR 273 – Standards for Universal Waste Management
 - 40 CFR 761 – Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
- United States Department of Transportation:
 - 49 CFR Part 107 – Hazardous Materials Program Procedures
 - 49 CFR Part 171 – General Information, Regulations, and Definitions
 - 49 CFR Part 172 – Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans
 - 49 CFR Part 173 – Shippers- General Requirements for Shipments and Packagings
- Alaska Statutes:
 - AS Section 18.60 – Safety
 - AS Section 23.05 – Department of Labor and Workforce Development

- Alaska Administrative Code:
 - 8 AAC 61 – Occupational Safety and Health Division
 - 8 AAC 61.1010-1190 – Occupational Safety and Health Standards
 - 18 AAC 60 – Solid Waste Management
 - 18 AAC 62 – Hazardous Waste
 - 18 AAC 70 – Water Quality Standards
 - 18 AAC 72 – Wastewater Treatment and Disposal
 - 18 AAC 75 – Oil and Other Hazardous Substances Pollution Control
 - 18 AAC 85 – Radiation Protection

10. Other Materials and Considerations

Other potentially hazardous materials may be present at the site, and there may also be other health, safety, and environmental considerations which are not a part of this report. Examples of these other potentially hazardous materials may include, but are not limited to: wastes classified as Hazardous Wastes; Hazardous Substances; Toxic and Hazardous Substances; Biological Wastes; among others. Examples of other health and safety considerations include, but are not limited to: electrical hazards; fire hazards; hazards from dust, odors, and fumes; scaffolding hazards; among others generally defined in 20 CFR 1910 – General Industry, 29 CFR 1926 – Construction, and other non-specific hazards subject to the General Duty Clause.

This report identifies those materials defined by this report as **common hazardous building materials**, however, these materials include only a small portion of the potential health, safety, and environmental hazards which may be present at the site. It is the duty of each employer to analyze each unique situation to determine potential health, safety, or environmental hazards which may be present. Persons performing these analysis may include, but are not limited to: those meeting the OSHA definition of an Authorized Person, Competent Person, or Qualified Person; individuals certified as a Certified Safety Professional, Certified Industrial Hygienist, or Certified Environmental Professional; individuals with academic degrees in Occupational Safety and Health and other closely related degrees.

Although most sites contain various potentially hazardous materials and workplace hazards, the assessment was not intended to identify and characterize each individual material or hazard. Materials or hazards which were apparent or noteworthy in the inspector's professional opinion were noted and are discussed below. Materials or hazards which could reasonably be expected to present immediate dangers to the health and safety of the site's occupants or others were noted and appropriate representatives notified.

A. Survey Results

Various cementitious products were present at the site, such as concrete block walls, poured concrete foundations, EIFS, Terrazzo flooring, and other products. These specific products are assumed to contain crystalline silica, but other components may be present at the site which also contain crystalline silica.

B. Discussion on Findings

Materials including, but not limited to, natural and artificially created sand, stone, rock, concrete, brick, block, mortar, ceramics, glass, pottery, and various blasting medias typically contain crystalline silica, and the disturbance of these types of materials are regulated by 29 CFR 1910.1053 and 29 CFR 1926.1153 if the crystalline silica is respirable. Respirable crystalline silica is defined by regulation as:

Quartz, cristobalite, and/or tridymite contained in airborne particles that are determined to be respirable by a sampling device designed to meet the characteristics for respirable-particle-size-selective samplers specified in the International Organization for Standardization (ISO) 7708:1995: Air Quality—Particle Size Fraction Definitions for Health-Related Sampling

A more generalized definition of respirable crystalline silica is “very small particles at least 100 times smaller than ordinary sand you might find on beaches and playgrounds”. Activities including, but not limited to, cutting, sawing, sanding, grinding, drilling, crushing, and abrasive blasting of materials containing crystalline silica will result in worker exposures to respirable crystalline silica dust.

C. Regulatory Discussion

There are numerous regulations governing other potentially hazardous materials or other health, safety, or environmental issues. A partial listing of applicable public laws, statutes, and regulations include:

- United States Code of Federal Regulations:
 - Title 1 – General Provisions
 - Title 24 – Housing and Urban Development
 - Title 29 – Labor
 - 29 CFR 1910.1053 – Respirable Crystalline Silica in General Industry
 - 29 CFR 1926.1153 – Respirable Crystalline Silica in Construction
 - Title 40 – Protection of the Environment
 - Title 46 – Shipping
 - Title 49 – Transportation
- Alaska Statutes:
 - AS Section 18.60 – Safety
 - AS Section 23.05 – Department of Labor and Workforce Development
- Alaska Administrative Code:
 - 8 AAC 61 – Occupational Safety and Health Division

D. Conclusions and Recommendations

All employers working at the site are responsible for identifying other potentially hazardous materials or other health, safety, and environmental hazards, and all work must be performed in accordance with all applicable laws whether they are referenced within this report or not.

11. Limitations

The conclusions and recommendations contained in this report are based on professional opinions with regard to the subject matter. These opinions have been arrived at in accordance with currently accepted consulting and industry standards and practices and are subject to the following inherent limitations:

A. Accuracy of Information

The conclusions, opinions, and recommendations found in this report are based in large part on the results of the laboratory analysis of samples of building materials collected during the limited assessments. Should such information provided be found to be inaccurate or unreliable, HTRW, LLC reserves the right to amend or revise its conclusions, opinions, and/or recommendations.

B. Site Conditions

This limited assessment did not include investigation of the entire site and may not be valid outside the assessment boundaries. The intent of this assessment was to identify **common hazardous building materials** that may be present at the site which may be affected by the Spring Hill Elementary School Roof Replacement Project at the building. This assessment was not intended to satisfy any regulatory requirements as they apply to **common hazardous building materials**. The assessment was performed while the building was unoccupied, with furniture, equipment and/or stored items in place, and did not include destructive examination to seek out concealed

materials, and many ***common hazardous building materials*** may not have been identified. This assessment was not intended to identify all ***common hazardous building materials*** that may be present at the building, however, every attempt was made to identify these materials within the budget and scope agreed on with our client and as detailed in this report. Homogenous areas of ***common hazardous building materials*** may vary from what was observed onsite and subsequently described in this report due to limiting factors such as the lack of historical information, paints and surfacing materials, or other concealing components. Although the information in this report may be used as supplemental information to future activities at the building, additional sampling and investigations must be performed by qualified persons prior to any future maintenance, demolition, or renovation activities.

C. Evolving Regulatory Landscape

Statutes, regulations, interpretations, court rulings, industry standards, best management practices, among other pertinent factors continuously change and evolve over time, and in many cases may be interpreted differently by different authorities having jurisdiction at local, state, federal, or other levels. The content of this report is based on these factors understood to be current at the time of this report and in the locality of where the buildings are located. HTRW, LLC reserves the right to amend or revise the content of this report should any of these factors change.

Appendix A – Asbestos

Appendix A.1 – Table of Asbestos Samples

Spring Hill Elementary School, 9911 Lake Otis Parkway, Anchorage, Alaska 99507					
SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	SAMPLE RESULTS	
SG0224-AQ01	L1: Grey gummy sealant used on various seams and intersections of the standing seam metal roofing components	Southeast corner of Roof F between the metal ridge flashing and the standing seam metal roofing panel	1	L1: 3.0% Chrysotile	
SG0224-AQ02	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	South side of Roof F at the metal flashing pieces covering the seams of the ridge flashing	10	L1: None Detected	
SG0224-AQ03	L1: Hard black gasket used between the wire glass clerestory glazing and the metal window casing L2: Sticky gum-like sealant used between the wire glass clerestory glazing and the metal window casing	North side of Roof A from eastern-most clerestory windows	15	L1: None Detected	
SG0224-AQ04	L1: Light grey gummy sealant used on various seams and intersections of the standing seam metal roofing components	From between the standing seam metal roof panel and metal drip edge/apron on the north side of Roof F to the east of the "jog" above the covered entryway below	23	L1: 3.0% Chrysotile	
SG0224-AQ05	L1: Off-white gum-like putty used at duct flanges of supply air, return air, and outside air systems	Between the outside air intake duct flange and the metal duct flange for the flexible duct connector to AHU-2 on the northeast side of the West Fan Room 254	43	L1: None Detected	
SG0224-AQ06	L1: Hard dark brown "puck" mastic used to adhere GCT1 to substrates	North side of Art Classroom 145	87	L1: None Detected	
SG0224-A01	L1: Grey gummy sealant used on various seams and intersections of the standing seam metal roofing components	Southeast corner of Roof F between the metal ridge flashing and the standing seam metal roofing panel	1	L1: 1.2% Chrysotile	

Spring Hill Elementary School, 9911 Lake Otis Parkway, Anchorage, Alaska 99507				
SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	SAMPLE RESULTS
SG0224-A02	L1: White rubbery "repair" sealant used on the metal flashing pieces covering the seams of the ridge flashing	North side of Roof E from the ridge of Roof F above	2	L1: None Detected
SG0224-A03	L1: Grey gummy sealant used on various seams and intersections of the standing seam metal roofing components	North side of Roof E between the metal ridge flashing and the standing seam metal roofing panel on Roof F above	3	L1: 1.2% Chrysotile
SG0224-A04	L1: Black EPDM-like membrane used at VTR penetration thru the standing seam metal roof	From VTR to the southeast of the boiler flue on Roof F	4	L1: None Detected
SG0224-A05	L1: Light grey spongy sealant commonly used with the EPDM-like membranes used at VTR penetrations and below the clerestory and louver "walls"	From VTR to the southeast of the boiler flue on Roof F	5	L1: Trace Chrysotile
SG0224-A06	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	From seam on metal cover around the mechanical curb for the boiler flue on Roof F	7	L1: None Detected
SG0224-A07	L1: White gummy sealant used on various seams and intersections of the standing seam metal roofing components	From inside of the crimped "standing seam" of the standing seam metal roof just above the mechanical curb for the boiler flue	8	L1: None Detected
SG0224-A08	L1: Light grey rubbery sealant used around louver and window penetrations thru the exterior EIFS L2: Grey cementitious plaster from EIFS	Northwest side of Roof E between the metal louver and EIFS siding	9	L1: None Detected L2: None Detected
SG0224-A09	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	South side of Roof F at the metal flashing pieces covering the seams of the ridge flashing	10	L1: Trace Chrysotile
SG0224-A10	L1: Light grey rubbery sealant used around louver and window penetrations thru the exterior EIFS	Northeast side of Roof A between the metal louver and metal drip edge	12	L1: None Detected by PLM or TEM NOB

Appendix A.1 – Table of Asbestos Samples

Spring Hill Elementary School, 9911 Lake Otis Parkway, Anchorage, Alaska 99507				
SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	SAMPLE RESULTS
SG0224-A11	L1: Hard grey sealant used on the interior seams of the outside air intake louvers located close to the bird screen and possibly further into the ducts	North east side of Roof A smeared onto the bird screen inside of the louver fins	11	L1: 1.6% Chrysotile
SG0224-A12	L1: Sticky black sealant used to adhere the EPDM-like membranes used at VTR penetrations and below the clerestory and louver "walls" to substrate	North east side of Roof A between EPDM-like membrane and metal flashing pieces at transition from the louver "wall" to the sloped roof below	13	L1: None Detected by PLM or TEM NOB
SG0224-A13	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	North west side of Roof A above louvers on seam in metal "L" channel	14	L1: Trace Chrysotile
SG0224-A14	L1: Hard black gasket used between the wire glass clerestory glazing and the metal window casing L2: Sticky gum-like sealant used between the wire glass clerestory glazing and the metal window casing	North side of Roof A from eastern-most clerestory windows	15	L1: None Detected by PLM, 0.3% Chrysotile by TEM NOB L2: None Detected by PLM, 0.4% Chrysotile by TEM NOB
SG0224-A15	L1: Light grey rubbery sealant used around louver and window penetrations thru the exterior EIFS	North side of Roof A from above eastern-most clerestory windows	16	L1: None Detected
SG0224-A16	L1: Sticky gum-like sealant used between the wire glass clerestory glazing and the metal window casing	North side of Roof A from central clerestory windows	17	L1: None Detected
SG0224-A17	L1: Grey gummy sealant used on various seams and intersections of the standing seam metal roofing components	North side of Roof A between the metal ridge flashing and the standing seam metal roofing panel below the central clerestory windows	18	L1: 1.2% Chrysotile
SG0224-A18	L1: Sticky black sealant used to adhere the EPDM-like membranes used at VTR penetrations and below the clerestory and louver "walls" to substrate	North side of Roof A between EPDM-like membrane and metal flashing pieces at transition from the clerestory "wall" to the sloped roof below	19	L1: None Detected

Appendix A.1 – Table of Asbestos Samples

Spring Hill Elementary School, 9911 Lake Otis Parkway, Anchorage, Alaska 99507				
SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	SAMPLE RESULTS
SG0224-A19	L1: Hard black gasket used between the wire glass clerestory glazing and the metal window casing L2: Sticky gum-like sealant used between the wire glass clerestory glazing and the metal window casing	North side of Roof A from above western-most clerestory windows	20	L1: None Detected L2: None Detected
SG0224-A20	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	Southeast corner of Roof D on bent metal flashing at the end of the ridge	21	L1: 0.5% Chrysotile
SG0224-A21	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	From inside of the crimped "standing seam" of the standing seam metal roof edge on the north side of Roof F to the east of the "jog" above the covered entryway below	22	L1: None Detected
SG0224-A22	L1: Light grey gummy sealant used on various seams and intersections of the standing seam metal roofing components	From between the standing seam metal roof panel and metal drip edge/apron on the north side of Roof F to the east of the "jog" above the covered entryway below	23	L1: 1.2% Chrysotile
SG0224-A23	L1: Off-white gum-like putty used at duct flanges of supply air, return air, and outside air systems	Between the outside air intake duct flange and the metal duct flange for the flexible duct connector to AHU-2 on the northeast side of the West Fan Room 254	43	L1: None Detected
SG0224-A24	L1: Hard white chalky insulation with brown specks inside of the "attic" doors used for the fan rooms	From exposed insulation on the bottom right of the "attic" door for the East Fan Room 233	45	L1: None Detected
SG0224-A25	L1: Off-white gum-like putty used at duct flanges of supply air, return air, and outside air systems	Between the outside air intake duct flange and the duct flange connected to AHU-3 on the southeast side of East Fan Room 233	47	L1: <0.25% Chrysotile
SG0224-A26	L1: White joint compound	South wall of East Fan Room 233 from unpainted area of gypsum board	60	L1: None Detected
SG0224-A27	L1: White gypsum board	South wall of East Fan Room 233 from unpainted area of gypsum board	60	L1: None Detected

Appendix A.1 – Table of Asbestos Samples

Spring Hill Elementary School, 9911 Lake Otis Parkway, Anchorage, Alaska 99507				
SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	SAMPLE RESULTS
SG0224-A28	L1: White joint compound	Southwest corner of East Fan Room 233 from painted gypsum board	61	L1: None Detected
SG0224-A29	L1: White gypsum board	South wall of East Fan Room 233 from hole in the painted gypsum board	62	L1: None Detected
SG0224-A30	L1: White chalky insulation with small gold flakes used inside of the generator exhaust stack	Southwest side of Generator Room 127	69	L1: None Detected
SG0224-A31	L1: Tan-brown flange gasket used between the generator muffler and exhaust stack	Southwest side of Generator Room 127	70	L1: 25% Chrysotile
SG0224-A32	L1: White chalky insulation with black/dark blue "hairs" used as the outer insulation layer inside of the generator muffler	Southwest side of Generator Room 127	71	L1: None Detected
SG0224-A33	L1: Fluffy white insulation blanket used as the inner insulation layer inside of the generator muffler	Southwest side of Generator Room 127	71	L1: None Detected
SG0224-A34	L1: (GCT1) 12" x 12" glued-on ceiling tile with 3/16"-1/4" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; only style of "non-repair tile" used throughout the school L2: Hard dark brown "puck" mastic used to adhere GCT1 to substrates	North side of MPR 130	85	L1: None Detected L2: None Detected
SG0224-A35	L1: (GCT1) 12" x 12" glued-on ceiling tile with 3/16"-1/4" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; only style of "non-repair tile" used throughout the school L2: Hard dark brown "puck" mastic used to adhere GCT1 to substrates L3: Pliable tan "puck" mastic used to adhere GCT1 to substrates	North side of Art Classroom 145	86	L1: None Detected L2: None Detected by PLM or TEM NOB L3: None Detected by PLM or TEM NOB

Appendix A.1 – Table of Asbestos Samples

Spring Hill Elementary School, 9911 Lake Otis Parkway, Anchorage, Alaska 99507				
SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	SAMPLE RESULTS
SG0224-A36	L1: (LCT4) 2' x 4' lay-in ceiling tile with 1/8" wide x 1/8"-1/4" long random fissures and 1/32"-1/8" holes; common "patch" tile	North side of 6 th Classroom 101	88	L1: None Detected
SG0224-A37	L1: (LCT5) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1 1/4" long directional fissures and 1/32"-1/16" holes; common "patch" tile	North side of 6 th Classroom 101	89	L1: None Detected
SG0224-A38	L1: (LCT2) 2' x 4' lay-in ceiling tile with 1/8"-3/16" oblong holes and 1/16" holes; uncommon "patch" tile	North side of 6 th Classroom 101	96	L1: None Detected
SG0224-A39	L1: (LCT7) 2' x 2' lay-in ceiling tile with 1/8" wide x 1/8"-1/4" long random fissures and 1/32"-1/8" holes; occasionally used at the classroom VAV outlets	North side of 6 th Classroom 101	97	L1: None Detected
SG0224-A40	L1: (LCT1) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 4' lay-in ceiling tile in school	South side of 4 th -6 th Resource Classroom 108	98	L1: None Detected
SG0224-A41	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	South side of 4 th -6 th Resource Classroom 108	99	L1: None Detected
SG0224-A42	L1: (LCT1) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 4' lay-in ceiling tile in school	Southeast side of 2 nd -6 th Extended Resource Classroom 116	104	L1: None Detected
SG0224-A43	L1: (LCT7) 2' x 2' lay-in ceiling tile with 1/8" wide x 1/8"-1/4" long random fissures and 1/32"-1/8" holes; occasionally used at the classroom VAV outlets	Southeast side of 2 nd -6 th Extended Resource Classroom 116	105	L1: None Detected

Appendix A.1 – Table of Asbestos Samples

Spring Hill Elementary School, 9911 Lake Otis Parkway, Anchorage, Alaska 99507				
SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	SAMPLE RESULTS
SG0224-A44	L1: (LCT4) 2' x 4' lay-in ceiling tile with 1/8" wide x 1/8"-1/4" long random fissures and 1/32"-1/8" holes; common "patch" tile	Southeast side of 2 nd -6 th Extended Resource Classroom 116	106	L1: None Detected
SG0224-A45	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	Southeast side of 2 nd -6 th Extended Resource Classroom 116	107	L1: None Detected
SG0224-A46	L1: (LCT5) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1 1/4" long directional fissures and 1/32"-1/16" holes; common "patch" tile	Southwest side of 2 nd -6 th Extended Resource Classroom 116	108	L1: None Detected
SG0224-A47	L1: Mixture of beige surface layer and dark grey base layer from exterior EIFS L2: Blue reinforcement mesh from exterior EIFS	From damaged area at east side of the exterior soffit outside of Entry 300B	109	L1: None Detected L2: None Detected
SG0224-A48	L1: White gypsum board	From damaged area of exterior wall above the lay-in ceiling at the southeast side of K Classroom 162	121	L1: None Detected
SG0224-A49	L1: (LCT1) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 4' lay-in ceiling tile in school	Southeast side of K Classroom 162	120	L1: None Detected
SG0224-A50	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	Southeast side of 1 st Classroom 170	126	L1: None Detected
SG0224-A51	L1: (LCT3) 2' x 4' lay-in ceiling tile with 3/16" wide x 3/16"-1 1/2" long semi-directional fissures and 1/16" holes; very uncommon tile in the building	Southwest side of 1 st Classroom 170	127	L1: None Detected

Appendix A.1 – Table of Asbestos Samples

Spring Hill Elementary School, 9911 Lake Otis Parkway, Anchorage, Alaska 99507				
SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	SAMPLE RESULTS
SG0224-A52	L1: (LCT1) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 4' lay-in ceiling tile in school	Northwest side of 1 st Classroom 171	129	L1: None Detected
SG0224-A53	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	North side of Staff Lounge 156 at 90 degree bend in wall	130	L1: None Detected
SG0224-A54	L1: White joint compound	Above the lay-in ceiling from the north side of Staff Lounge 156 at 90 degree bend in wall	131	L1: None Detected
SG0224-A55	L1: White gypsum board	Above the lay-in ceiling from the north side of Staff Lounge 156 at 90 degree bend in wall	131	L1: None Detected
SG0224-A56	L1: (LCT2) 2' x 4' lay-in ceiling tile with 1/8"-3/16" oblong holes and 1/16" holes; uncommon "patch" tile	Southeast side of Principal 149	133	L1: None Detected
SG0224-A57	L1: (LCT1) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 4' lay-in ceiling tile in school	Southwest side of Principal 149	132	L1: None Detected
SG0224-A58	L1: (LCT5) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1 1/4" long directional fissures and 1/32"-1/16" holes; common "patch" tile	West side of Main Office 148	134	L1: None Detected
SG0224-A59	L1: (LCT3) 2' x 4' lay-in ceiling tile with 3/16" wide x 3/16"-1 1/2" long semi-directional fissures and 1/16" holes; very uncommon tile in the building	West side of Main Office 148	135	L1: None Detected
SG0224-A60	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	West side of Secretary Storage 150	136	L1: None Detected

Appendix A.1 – Table of Asbestos Samples

Spring Hill Elementary School, 9911 Lake Otis Parkway, Anchorage, Alaska 99507				
SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	SAMPLE RESULTS
SG0224-A61	L1: White joint compound	From damaged area of exterior wall above the lay-in ceiling at the southeast side of K Classroom 162	121	L1: None Detected

Notes to Table of Asbestos Samples:

- “L1”, “L2”, “L3” designations indicate “Layer 1”, “Layer 2”, “Layer 3”, etc. found in the individual samples. Materials shown in bold font are materials which were found to contain asbestos by laboratory analysis.

Sample data from previous sampling events is not included in this limited report. Refer to records available from the Anchorage School District.

Appendix A.2 – Final Laboratory Certificate of Analysis & Chain of Custody

Appendix A.2 – Final Laboratory Certificate of Analysis & Chain of Custody



CHAIN C. CUSTODY

11471 Business Bl #773442
Eagle River, Alaska 99577
(907)-917-3801

Project Number	2024-05	Selected Laboratory	Alaska Asbestos Laboratory
Project Name	Anchorage School District, Spring Hill Elementary School Roof Replacement	Shipping Method	Self, Chris Johnson
Address/Location	9911 Lake Otis Parkway, Anchorage, Alaska 99507	Date and Time	02/10/2024 6:00 PM
Client	MCG Explore Design	Samples Received By	
Inspector/Collected By	Christopher T. Octosen	Date and Time	
EPA B.I.# and State	TB14-124-18714/Alaska	Analyst Signature(s)	
Collection Date	02/10/2024	Quantity	6
Requested Analysis	Asbestos Bulk by PLM, EPA Method 600, R93-116	Turnaround	RUSH
Special Notes	E-mail results to cottosen@htrw-llc.com. Provide a scanned color copy of this chain of custody or return the original hard copies. Do not analyze wood, paint, or foam or perform composite analysis of gypsum wall board and joint compound unless specifically asked for in the sample description.		

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
SG0224-AQ01	L1: Grey gummy sealant used between the ridge flashing & the SSMB panels	S.E. corner of Roof F	TBD	
SG0224-AQ02	L1: Red gummy & sometimes crumbly sealant used on the seam covers of the ridge flashing	At the center of Roof E collected N.E. side of Roof A, collected from Roof F ridge	TBD	
SG0224-AQ03	L1: Black sticky & gummy window glazing compound on exterior side of clerestory windows	East corner row of windows on Roof A	TBD	



CHAIN OF CUSTODY

11471 Business Blvd., #773442
 Eagle River, Alaska 99577
 (907)-917-3801

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
SG0224-AQ04	L1: Grey gummy sealant used between the SSMB panels & flashing at drip edges	North side of Roof F at bottom edge of roofing	TBD	
SG0224-AQ05	L1: Off-white gummy putty used between the outside air intake duct flange to the flexible duct connector flange to AHUZ	N.E. side of West Fan Room 254	TBD	
SG0224-AQ06	L1: Dark brown "putty" mastic used to adhere GCTI to substrate -ANALYZE MASTIC ONLY-	North side of Art 148 at damaged GCTI	TBD	
SG0224-AQ07	L1: ENDS	END	END	END
SG0224-AQ08	L1: _____	_____	_____	_____
SG0224-AQ09	L1: _____	_____	_____	_____
SG0224-AQ10	L1: _____	_____	_____	_____

Alaska Asbestos Laboratory

Bulk Asbestos Analysis by PLM

3633 Parsons Avenue Anchorage, Alaska 99508

Client: HTRW, LLC	Client Project #: 2024-05	AAL Project #: 24-0141
11471 Business Blvd, #773442	Collection Date: 02/10/24	Report #: B24-0141
Eagle River, AK 99577	Collected By: Client	Report Date: 02/12/24
Project Name/Location: Anchorage School District, Spring Hill Elementary School/Roof Replacement		
Date Received: 02/10/24	Date Analyzed: 02/12/24	Sample Count: 6
Received By: J. Hicklin	Analysis By: J. Hicklin	Layer Count: 6
		Report By: J. Hicklin
		TAT: Rush

Client ID #	AAL ID #	Location: SE Corner of Roof F				Layer 1 of 1	
SG0224-AQ01	B24-0241	Non-Asbestos Components				Asbestos	
Material	Color	Homogenous	Misc. Non-Fibrous	%	Non-Asbestos Fibrous	%	Type
			Total Non-Fibrous	95.00	Cellulose	2.00	Chrysotile
Sealant	Gray	Yes					3.00
Comment:					Total Non-Asbestos Fibrous	2.00	Total Asbestos
							3.00

Client ID #	AAL ID #	Location: NE Side of Roof A, Collected from Roof F Ridge				Layer 1 of 1	
SG0224-AQ02	B24-0242	Non-Asbestos Components				Asbestos	
Material	Color	Homogenous	Misc. Non-Fibrous	%	Non-Asbestos Fibrous	%	Type
			Total Non-Fibrous	97.00	Cellulose	3.00	Non-Detect
Sealant	Red	Yes					
Comment:					Total Non-Asbestos Fibrous	3.00	Total Asbestos
							Non-Detect

Client ID #	AAL ID #	Location: East Row of Windows on Roof A				Layer 1 of 1	
SG0224-AQ03	B24-0243	Non-Asbestos Components				Asbestos	
Material	Color	Homogenous	Misc. Non-Fibrous	%	Non-Asbestos Fibrous	%	Type
			Total Non-Fibrous	99.90	Cellulose	0.10	Non-Detect
Glaze	Black	Yes					
Comment:					Total Non-Asbestos Fibrous	0.10	Total Asbestos
							Non-Detect

Client ID #	AAL ID #	Location: North Side of Roof F at Bottom Edge of Roofing				Layer 1 of 1	
SG0224-AQ04	B24-0244	Non-Asbestos Components				Asbestos	
Material	Color	Homogenous	Misc. Non-Fibrous	%	Non-Asbestos Fibrous	%	Type
			Total Non-Fibrous	95.00	Cellulose	2.00	Chrysotile
Sealant	Gray	Yes					3.00
Comment:					Total Non-Asbestos Fibrous	2.00	Total Asbestos
							3.00

Client ID #	AAL ID #	Location: NE Side of West Fan Room 254				Layer 1 of 1	
SG0224-AQ05	B24-0245	Non-Asbestos Components				Asbestos	
Material	Color	Homogenous	Misc. Non-Fibrous	%	Non-Asbestos Fibrous	%	Type
			Total Non-Fibrous	97.00	Cellulose	3.00	Non-Detect
Sealant	Off-White	Yes					
Comment:					Total Non-Asbestos Fibrous	3.00	Total Asbestos
							Non-Detect

Client ID #	AAL ID #	Location: North Side of ART 148 at Damaged GCTI				Layer 1 of 1	
SG0224-AQ06	B24-0246	Non-Asbestos Components				Asbestos	
Material	Color	Homogenous	Misc. Non-Fibrous	%	Non-Asbestos Fibrous	%	Type
			Total Non-Fibrous	94.90	Cellulose	0.10	Non-Detect
Mastic	Brown	Yes			Woolastonite	3.00	
					Talc	2.00	
Comment:					Total Non-Asbestos Fibrous	5.10	Total Asbestos
							Non-Detect

Alaska Asbestos Laboratory

Bulk Asbestos Analysis by PLM

3633 Parsons Avenue Anchorage, Alaska 99508

AAL Project #: 24-0141

Report #: B24-0141

Client Project #: 2024-05

Report Date: 02/12/24

Please Note:

1. All quantitation of material in this report is based on a Calibrated Visual Estimate and not weight, unless otherwise noted. Calibrated Visual Estimate's are an accepted method of quantitation by the National Voluntary Laboratory Accreditation Program (NVLAP) for bulk asbestos analysis by PLM.
2. Methods authorized by NVLAP do not include analysis of materials where the asbestos content is not consistently distributed throughout the material. Examples would include: soil, debris, vermiculite insulation, etc. However, under some circumstances, such as a small amount of material present, further sample reduction/homogenization is not practical and PLM can be appropriate. AAL will work with clients to determine the best analytical methods for the sample. Transmission Electron Microscopy (TEM) is also an available analytical option.

Methods: EPA 600/R-93/116 and EPA-40 CFR Appendix E to Subpart E of Part 763. AAL will use either method as directed by the client and/or as indicated by the sample material.

Reporting Limit: Less than 1% asbestos content by Calibrated Visual Estimate using PLM

Regulatory Limit: Greater than 1% asbestos content per the EPA

This analytical report relates only to the samples analyzed (as delivered). This report may not be reproduced, except in full, without written approval by Alaska Asbestos Laboratory (AAL). AAL makes no warranty (either direct or implied) as to the accuracy or content of any materials or information submitted by the client in preparing and presenting analytical results. The interpretation and regulatory compliance in regards to any analytical results are the sole responsibility of the client. Any information reported, in addition to analytical findings, is for informational purposes only. AAL does not provide any consultation for remediation of regulated materials. Unless otherwise noted, all samples were received in acceptable condition and suitable for analysis. The EPA recommends all non-friable organically bound materials (NOB), such as vinyl floor tiles, found not to contain asbestos by PLM analysis, be further analyzed by Transmission Electron Microscopy (TEM).

Information provided by the client may include, but is not limited to: client ID's (sample numbers), sample locations, sample descriptions (listed as material on report), collection/sampling information sheets including location(s)/drawings/maps. AAL assumes no liability for any missing or non-submitted information and, at its sole discretion, reserves the right to supplement or add industry standard designations or other information to the analytical report.



Approved By: Joel Hicklin
Joel Hicklin, Laboratory Manager

Date: 02/12/2024



CHAIN OF CUSTODY

**11471 Business Blvd., #773442
Eagle River, Alaska 99577
(907)-917-3801**

Project Number	2024-05			Selected Laboratory	iATL
Project Name	Anchorage School District, Spring Hill Elementary School Roof Replacement				
Address/Location	9911 Lake Otis Parkway, Anchorage, Alaska 99507				
Client	MCG Explore Design				
Inspector/Collected By	Christopher T. Ottosen				
EPA B.I.# and State	TB14-124-18714/Alaska				
Collection Date	02/10/2024	Quantity	61	Turnaround	3-Day
Requested Analysis	Asbestos Bulk by PLM, EPA Method 600, R93-116				
Special Notes	E-mail results to cottosen@htrw-llc.com . Provide a scanned color copy of this chain of custody or return the original hard copies. Do not analyze wood, paint, or foam or perform composite analysis of gypsum wall board and joint compound unless specifically asked for in the sample description.				

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
SG0224-A01	L1: Grey gummy sealant used on various seams and intersections of the standing seam metal roofing components	Southeast corner of Roof F between the metal ridge flashing and the standing seam metal roofing panel	1	7727234
SG0224-A02	L1: White rubbery "repair" sealant used on the metal flashing pieces covering the seams of the ridge flashing	North side of Roof E from the ridge of Roof F above	2	7727235
SG0224-A03	L1: Grey gummy sealant used on various seams and intersections of the standing seam metal roofing components	North side of Roof E between the metal ridge flashing and the standing seam metal roofing panel on Roof F above	3	7727236
SG0224-A04	L1: Black EPDM-like membrane used at VTR penetration thru the standing seam metal roof	From VTR to the southeast of the boiler flue on Roof F	4	7727237
SG0224-A05	L1: Light grey spongy sealant commonly used with the EPDM-like membranes used at VTR penetrations and below the clerestory and louver "walls"	From VTR to the southeast of the boiler flue on Roof F	5	7727238
SG0224-A06	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	From seam on metal cover around the mechanical curb for the boiler flue on Roof F	7	7727239
SG0224-A07	L1: White gummy sealant used on various seams and intersections of the standing seam metal roofing components	From inside of the crimped "standing seam" of the standing seam metal roof just above the mechanical curb for the boiler flue	8	7727240



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SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
SG0224-A08	L1: Light grey rubbery sealant used around louver and window penetrations thru the exterior EIFS L2: Grey cementitious plaster from EIFS	Northwest side of Roof E between the metal louver and EIFS siding	9	7727241
SG0224-A09	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	South side of Roof F at the metal flashing pieces covering the seams of the ridge flashing	10	7727242
SG0224-A10	L1: Light grey rubbery sealant used around louver and window penetrations thru the exterior EIFS	Northeast side of Roof A between the metal louver and metal drip edge	12	7727243
SG0224-A11	L1: Hard grey sealant used on the interior seams of the outside air intake louvers located close to the bird screen and possibly further into the ducts	Northeast side of Roof A smeared onto the bird screen inside of the louver fins	11	7727244
SG0224-A12	L1: Sticky black sealant used to adhere the EPDM-like membranes used at VTR penetrations and below the clerestory and louver "walls" to substrate	Northeast side of Roof A between EPDM-like membrane and metal flashing pieces at transition from the louver "wall" to the sloped roof below	13	7727245
SG0224-A13	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	Northwest side of Roof A above louvers on seam in metal "L" channel	14	7727246
SG0224-A14	L1: Hard black gasket used between the wire glass clerestory glazing and the metal window casing L2: Sticky gum-like sealant used between the wire glass clerestory glazing and the metal window casing	North side of Roof A from eastern-most clerestory windows	15	7727247
SG0224-A15	L1: Light grey rubbery sealant used around louver and window penetrations thru the exterior EIFS	North side of Roof A from above eastern-most clerestory windows	16	7727248
SG0224-A16	L1: Sticky gum-like sealant used between the wire glass clerestory glazing and the metal window casing	North side of Roof A from central clerestory windows	17	7727249
SG0224-A17	L1: Grey gummy sealant used on various seams and intersections of the standing seam metal roofing components	North side of Roof A between the metal ridge flashing and the standing seam metal roofing panel below the central clerestory windows	18	7727250
SG0224-A18	L1: Sticky black sealant used to adhere the EPDM-like membranes used at VTR penetrations and below the clerestory and louver "walls" to substrate	North side of Roof A between EPDM-like membrane and metal flashing pieces at transition from the clerestory "wall" to the sloped roof below	19	7727251
SG0224-A19	L1: Hard black gasket used between the wire glass clerestory glazing and the metal window casing L2: Sticky gum-like sealant used between the wire glass clerestory glazing and the metal window casing	North side of Roof A from above western-most clerestory windows	20	7727252



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SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
SG0224-A20	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	Southeast corner of Roof D on bent metal flashing at the end of the ridge	21	7727253
SG0224-A21	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	From inside of the crimped "standing seam" of the standing seam metal roof edge on the north side of Roof F to the east of the "jog" above the covered entryway below	22	7727254
SG0224-A22	L1: Light grey gummy sealant used on various seams and intersections of the standing seam metal roofing components	From between the standing seam metal roof panel and metal drip edge/apron on the north side of Roof F to the east of the "jog" above the covered entryway below	23	7727255
SG0224-A23	L1: Off-white gum-like putty used at duct flanges of supply air, return air, and outside air systems	Between the outside air intake duct flange and the metal duct flange for the flexible duct connector to AHU-2 on the northeast side of the West Fan Room 254	43	7727256
SG0224-A24	L1: Hard white chalky insulation with brown specks inside of the "attic" doors used for the fan rooms	From exposed insulation on the bottom right of the "attic" door for the East Fan Room 233	45	7727257
SG0224-A25	L1: Off-white gum-like putty used at duct flanges of supply air, return air, and outside air systems	Between the outside air intake duct flange and the duct flange connected to AHU-3 on the southeast side of East Fan Room 233	47	7727258
SG0224-A26	L1: White joint compound	South wall of East Fan Room 233 from unpainted area of gypsum board	60	7727259
SG0224-A27	L1: White gypsum board	South wall of East Fan Room 233 from unpainted area of gypsum board	60	7727260
SG0224-A28	L1: White joint compound	Southwest corner of East Fan Room 233 from painted gypsum board	61	7727261
SG0224-A29	L1: White gypsum board	South wall of East Fan Room 233 from hole in the painted gypsum board	62	7727262
SG0224-A30	L1: White chalky insulation with small gold flakes used inside of the generator exhaust stack	Southwest side of Generator Room 127	69	7727263
SG0224-A31	L1: Tan-brown flange gasket used between the generator muffler and exhaust stack	Southwest side of Generator Room 127	70	7727264
SG0224-A32	L1: White chalky insulation with black/dark blue "hairs" used as the outer insulation layer inside of the generator muffler	Southwest side of Generator Room 127	71	7727265
SG0224-A33	L1: Fluffy white insulation blanket used as the inner insulation layer inside of the generator muffler	Southwest side of Generator Room 127	71	7727266



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SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
SG0224-A34	L1: (GCT1) 12" x 12" glued-on ceiling tile with 3/16"-1/4" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; only style of "non-repair tile" used throughout the school L2: Hard dark brown "puck" mastic used to adhere GCT1 to substrates	North side of MPR 130	85	7727267
SG0224-A35	L1: (GCT1) 12" x 12" glued-on ceiling tile with 3/16"-1/4" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; only style of "non-repair tile" used throughout the school L2: Hard dark brown "puck" mastic used to adhere GCT1 to substrates L3: Pliable tan "puck" mastic used to adhere GCT1 to substrates L1: (LCT4) 2' x 4' lay-in ceiling tile with 1/8" wide x 1/8"-1/4" long random fissures and 1/32"-1/8" holes; common "patch" tile	North side of Art Classroom 145	86	7727268
SG0224-A36	L1: (LCT5) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1/4" long directional fissures and 1/32"-1/16" holes; common "patch" tile	North side of 6 th Classroom 101	88	7727269
SG0224-A37	L1: (LCT2) 2' x 4' lay-in ceiling tile with 1/8"-3/16" oblong holes and 1/16" holes; uncommon "patch" tile	North side of 6 th Classroom 101	89	7727270
SG0224-A38	L1: (LCT7) 2' x 2' lay-in ceiling tile with 1/8" wide x 1/8"-1/4" long random fissures and 1/32"-1/8" holes; occasionally used at the classroom VAV outlets	North side of 6 th Classroom 101	96	7727271
SG0224-A39	L1: (LCT1) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 4' lay-in ceiling tile in school	South side of 4 th -6 th Resource Classroom 108	97	7727272
SG0224-A40	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	South side of 4 th -6 th Resource Classroom 108	98	7727273
SG0224-A41	L1: (LCT7) 2' x 2' lay-in ceiling tile with 1/8" wide x 1/8"-1/4" long random fissures and 1/32"-1/8" holes; occasionally used at the classroom VAV outlets	South side of 4 th -6 th Resource Classroom 108	99	7727274
SG0224-A42	L1: (LCT7) 2' x 2' lay-in ceiling tile with 1/8" wide x 1/8"-1/4" long random fissures and 1/32"-1/8" holes; occasionally used at the classroom VAV outlets	Southeast side of 2 nd -6 th Extended Resource Classroom 116	104	7727275
SG0224-A43	L1: (LCT4) 2' x 4' lay-in ceiling tile with 1/8" wide x 1/8"-1/4" long random fissures and 1/32"-1/8" holes; common "patch" tile	Southeast side of 2 nd -6 th Extended Resource Classroom 116	105	7727276
SG0224-A44	L1: (LCT4) 2' x 4' lay-in ceiling tile with 1/8" wide x 1/8"-1/4" long random fissures and 1/32"-1/8" holes; common "patch" tile	Southeast side of 2 nd -6 th Extended Resource Classroom 116	106	7727277



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SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
SG0224-A45	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	Southeast side of 2 nd -6 th Extended Resource Classroom 116	107	7727278
SG0224-A46	L1: (LCT5) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1 1/4" long directional fissures and 1/32"-1/16" holes; common "patch" tile	Southwest side of 2 nd -6 th Extended Resource Classroom 116	108	7727279
SG0224-A47	L1: Mixture of beige surface layer and dark grey base layer from exterior EIFS L2: Blue reinforcement mesh from exterior EIFS **DO NOT ANALYZE THE STYROFOAM**	From damaged area at east side of the exterior soffit outside of Entry 300B	109	7727280
SG0224-A48	L1: White gypsum board	From damaged area of exterior wall above the lay-in ceiling at the southeast side of K Classroom 162	121	7727281
SG0224-A49	L1: (LCT1) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 4' lay-in ceiling tile in school	Southeast side of K Classroom 162	120	7727282
SG0224-A50	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	Southeast side of 1 st Classroom 170	126	7727283
SG0224-A51	L1: (LCT3) 2' x 4' lay-in ceiling tile with 3/16" wide x 3/16"-1 1/2" long semi-directional fissures and 1/16" holes; very uncommon tile in the building	Southwest side of 1 st Classroom 170	127	7727284
SG0224-A52	L1: (LCT1) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 4' lay-in ceiling tile in school	Northwest side of 1 st Classroom 171	129	7727285
SG0224-A53	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	North side of Staff Lounge 156 at 90 degree bend in wall	130	7727286
SG0224-A54	L1: White joint compound	Above the lay-in ceiling from the north side of Staff Lounge 156 at 90 degree bend in wall	131	7727287
SG0224-A55	L1: White gypsum board	Above the lay-in ceiling from the north side of Staff Lounge 156 at 90 degree bend in wall	131	7727288
SG0224-A56	L1: (LCT2) 2' x 4' lay-in ceiling tile with 1/8"-3/16" oblong holes and 1/16" holes; uncommon "patch" tile	Southeast side of Principal 149	133	7727289



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SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
SG0224-A57	L1: (LCT1) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 4' lay-in ceiling tile in school	Southwest side of Principal 149	132	7727290
SG0224-A58	L1: (LCT5) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long directional fissures and 1/32"-1/16" holes; common "patch" tile	West side of Main Office 148	134	7727291
SG0224-A59	L1: (LCT3) 2' x 4' lay-in ceiling tile with 3/16" wide x 3/16"-1 1/2" long semi-directional fissures and 1/16" holes; very uncommon tile in the building	West side of Main Office 148	135	7727292
SG0224-A60	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	West side of Secretary Storage 150	136	7727293
SG0224-A61	L1: White joint compound	From damaged area of exterior wall above the lay-in ceiling at the southeast side of K Classroom 162	121	7727294

--END--

ORIGIN/D/ANCA (907) 726-3568
CHRISTOPHER OTTOSEN
HTRW, LLC
11471 BUSINESS BLVD.
713442
EAGLE RIVER, AK 99577
UNITED STATES, US

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SUITE B

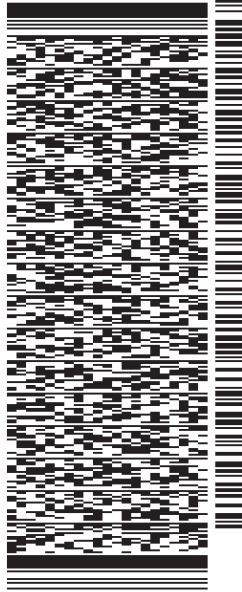
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9000 Commerce Parkway Suite B
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Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: HTRW, LLC
11471 Business Blvd., #773442
Anchorage AK 99577

Report Date: 2/27/2024
Report No.: 696263 - PLM Rev #2, 2/28/2024
Project: Anchorage School District Spring Hill ES
Roof Replacement
Project No.: 2024-05

Client: HTR114

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727234 Client No.: SG0224-A01	Analyst Observation: Grey Sealant Client Description: L1: Grey Gummy Sealant	Location: Southeast Corner of Roof F. Photo 1 Facility: Percent Non-Fibrous Material: 98.8
Percent Asbestos: <i>PC 1.2 Chrysotile</i>	Percent Non-Asbestos Fibrous Material: None Detected	
Lab No.: 7727235 Client No.: SG0224-A02	Analyst Observation: White Sealant Client Description: L1: White Rubbery "Repair" Sealant	Location: North Side of Roof E From the Ridge of Roof F. Photo 2 Facility: Percent Non-Fibrous Material: 100
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: None Detected	
Lab No.: 7727236 Client No.: SG0224-A03	Analyst Observation: Grey Sealant Client Description: L1: Grey Gummy Sealant	Location: North Side of Roof E. Photo 3 Facility: Percent Non-Fibrous Material: 98.8
Percent Asbestos: <i>PC 1.2 Chrysotile</i>	Percent Non-Asbestos Fibrous Material: None Detected	
Lab No.: 7727237 Client No.: SG0224-A04	Analyst Observation: Black Sealant Client Description: L1: Black EPDM-Like Membrane	Location: From VTR to the Southeast of the Boiler Flue. Photo 4 Facility: Percent Non-Fibrous Material: 100
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: None Detected	
Lab No.: 7727238 Client No.: SG0224-A05	Analyst Observation: Grey/Black Sealant Client Description: L1: Light Grey Spongy Sealant	Location: From VTR to the Southeast of the Boiler Flue. Photo 5 Facility: Percent Non-Fibrous Material: 100
Percent Asbestos: <i>PC Trace Chrysotile</i>	Percent Non-Asbestos Fibrous Material: None Detected	
Lab No.: 7727239 Client No.: SG0224-A06	Analyst Observation: Red/Grey Sealant Client Description: L1: Dark Red Gummy Sealant	Location: From Seam on Metal Cover Around the Mechanical Curb. Photo 7 Facility: Percent Non-Fibrous Material: 100
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: None Detected	

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 2/13/2024
Date Analyzed: 02/19/2024
Signature:
Analyst: Ellen Smith

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director



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CERTIFICATE OF ANALYSIS

Client: HTRW, LLC 11471 Business Blvd., #773442 Anchorage AK 99577	Report Date: 2/27/2024 Report No.: 696263 - PLM Project: Anchorage School District Spring Hill ES Roof Replacement Project No.: 2024-05	Rev #2, 2/28/2024
Client: HTR114		

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727240 Client No.: SG0224-A07	Analyst Observation: Red/Grey Sealant Client Description: L1: White Gummy Sealant	Location: From Inside of the Crimped "Standing Seam". Photo 8 Facility: Percent Non-Fibrous Material: 100
<u>Percent Asbestos:</u> <i>None Detected</i>	<u>Percent Non-Asbestos Fibrous Material:</u> None Detected	
Lab No.: 7727241 Client No.: SG0224-A08	Analyst Observation: Lt Grey Sealant Client Description: L1: Light Grey Rubbery Sealant	Location: Northwest Side of Roof E. Photo 9 Facility: Percent Non-Fibrous Material: 100
<u>Percent Asbestos:</u> <i>None Detected</i>	<u>Percent Non-Asbestos Fibrous Material:</u> None Detected	
Lab No.: 7727241(L2) Client No.: SG0224-A08	Analyst Observation: Grey Cementitious Client Description: L2: Grey Cementitious Plaster From EIFS	Location: Northwest Side of Roof E. Photo 9 Facility: Percent Non-Fibrous Material: 100
<u>Percent Asbestos:</u> <i>None Detected</i>	<u>Percent Non-Asbestos Fibrous Material:</u> None Detected	
Lab No.: 7727242 Client No.: SG0224-A09	Analyst Observation: Red Sealant Client Description: L1: Dark Red Gummy Sealant	Location: South Side of Roof F. Photo 10 Facility: Percent Non-Fibrous Material: 100
<u>Percent Asbestos:</u> PC Trace Chrysotile	<u>Percent Non-Asbestos Fibrous Material:</u> None Detected	
Lab No.: 7727243 Client No.: SG0224-A10	Analyst Observation: Lt Grey Sealant Client Description: L1: Light Grey Rubbery Sealant	Location: Northeast Side of Roof A . Photo 12 Facility: Percent Non-Fibrous Material: 100
<u>Percent Asbestos:</u> <i>None Detected</i>	<u>Percent Non-Asbestos Fibrous Material:</u> None Detected	
Lab No.: 7727244 Client No.: SG0224-A11	Analyst Observation: Grey Sealant Client Description: L1: Hard Grey Sealant	Location: Northeast Side of Roof A. Photo 11 Facility: Percent Non-Fibrous Material: 98.4
<u>Percent Asbestos:</u> PC 1.6 Chrysotile	<u>Percent Non-Asbestos Fibrous Material:</u> None Detected	

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 2/13/2024
Date Analyzed: 02/19/2024
Signature:
Analyst: Ellen Smith

Approved By:
Frank E. Ehrenfeld, III
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CERTIFICATE OF ANALYSIS

Client: HTRW, LLC
11471 Business Blvd., #773442
Anchorage AK 99577

Report Date: 2/27/2024
Report No.: 696263 - PLM Rev #2, 2/28/2024
Project: Anchorage School District Spring Hill ES
Roof Replacement
Project No.: 2024-05

Client: HTR114

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727245
Client No.: SG0224-A12
Analyst Observation: Black Sealant
Client Description: L1: Sticky Black Sealant
Location: Northeast Side of Roof A. Photo 13
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 7727246
Client No.: SG0224-A13
Analyst Observation: Red Sealant
Client Description: L1: Dark Red Gummy Sealant
Location: Northwest Side of Roof A . Photo 14
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
PC Trace Chrysotile None Detected 100

Lab No.: 7727247
Client No.: SG0224-A14
Analyst Observation: Black Gasket
Client Description: L1: Hard Black Gasket
Location: North Side of Roof A. Photo 15
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 7727247(L2)
Client No.: SG0224-A14
Analyst Observation: Black Sealant
Client Description: L2: Sticky Gum-Like Sealant
Location: North Side of Roof A. Photo 15
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 7727248
Client No.: SG0224-A15
Analyst Observation: Lt Grey Sealant
Client Description: L1: Light Grey Rubbery Sealant
Location: North Side of Roof A. Photo 16
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 7727249
Client No.: SG0224-A16
Analyst Observation: Black Sealant
Client Description: L1: Sticky Gum-Like Sealant
Location: North Side of Roof A. Photo 17
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 2/13/2024
Date Analyzed: 02/19/2024
Signature:
Analyst: Ellen Smith

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director



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 Telephone: 856-231-9449
 Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: HTRW, LLC 11471 Business Blvd., #773442 Anchorage AK 99577	Report Date: 2/27/2024 Report No.: 696263 - PLM Project: Anchorage School District Spring Hill ES Roof Replacement Project No.: 2024-05	Rev #2, 2/28/2024
Client: HTR114		

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727250 Client No.: SG0224-A17 <u>Percent Asbestos:</u> PC 1.2 Chrysotile	Analyst Observation: Grey Sealant Client Description: L1: Grey Gummy Sealant <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: North Side of Roof A. Photo 18 Facility: <u>Percent Non-Fibrous Material:</u> 98.8
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Lab No.: 7727251 Client No.: SG0224-A18 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Black Sealant Client Description: L1: Sticky Black Sealant <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: North Side of Roof A. Photo 19 Facility: <u>Percent Non-Fibrous Material:</u> 100
--	--	--

Lab No.: 7727252 Client No.: SG0224-A19 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Black Gasket Client Description: L1: Hard Black Gasket <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: North Side of Roof A. Photo 20 Facility: <u>Percent Non-Fibrous Material:</u> 100
--	--	--

Lab No.: 7727252(L2) Client No.: SG0224-A19 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Black Sealant Client Description: L2: Sticky Gum-Like Sealant <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: North Side of Roof A. Photo 20 Facility: <u>Percent Non-Fibrous Material:</u> 100
--	---	--

Lab No.: 7727253 Client No.: SG0224-A20 <u>Percent Asbestos:</u> PC 0.5 Chrysotile	Analyst Observation: Red Sealant Client Description: L1: Dark Red Gummy Sealant <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Southeast Corner of Roof D. Photo 21 Facility: <u>Percent Non-Fibrous Material:</u> 99.5
--	--	--

Lab No.: 7727254 Client No.: SG0224-A21 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Red Sealant Client Description: L1: Dark Red Gummy Sealant <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: From Inside of the Crimped "Standing Seam". Photo 22 Facility: <u>Percent Non-Fibrous Material:</u> 100
--	--	---

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 2/13/2024
 Date Analyzed: 02/19/2024
 Signature:
 Analyst: Ellen Smith

Approved By:
 Frank E. Ehrenfeld, III
 Laboratory Director



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CERTIFICATE OF ANALYSIS

Client: HTRW, LLC 11471 Business Blvd., #773442 Anchorage AK 99577	Report Date: 2/27/2024 Report No.: 696263 - PLM Project: Anchorage School District Spring Hill ES Roof Replacement	Rev #2, 2/28/2024
Client: HTR114	Project No.: 2024-05	

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727255 Client No.: SG0224-A22	Analyst Observation: Grey Sealant Client Description: L1: Light Grey Gummy Sealant	Location: From Between the Standing Seam Metal. Photo 23 Facility: Percent Non-Fibrous Material: 98.8
Percent Asbestos: <i>PC 1.2 Chrysotile</i>	Percent Non-Asbestos Fibrous Material: None Detected	
Lab No.: 7727256 Client No.: SG0224-A23	Analyst Observation: Off-White Putty Client Description: L1: Off-White Gum-Like Putty	Location: Between the Outside Air Intake Duct Flange. Photo 43 Facility: Percent Non-Fibrous Material: 100
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: None Detected	
Lab No.: 7727257 Client No.: SG0224-A24	Analyst Observation: White Insulation Client Description: L1: Hard White Chalky Insulation With Brown Specks	Location: From Exposed Insulation on the Bottom Right. Photo 45 Facility: Percent Non-Fibrous Material: 90
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: 10 Cellulose	
Lab No.: 7727258 Client No.: SG0224-A25	Analyst Observation: White Putty Client Description: L1: Off-White Gum-Like Putty	Location: Between the Outside Air Intake Duct Flange. Photo 47 Facility: Percent Non-Fibrous Material: 100
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: None Detected	
Lab No.: 7727259 Client No.: SG0224-A26	Analyst Observation: White Joint Compound Client Description: L1: White Joint Compound	Location: South Wall of East Fan Room 223. Photo 60 Facility: Percent Non-Fibrous Material: 100
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: None Detected	

Note: Drywall not present.

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CERTIFICATE OF ANALYSIS

Client: HTRW, LLC
11471 Business Blvd., #773442
Anchorage AK 99577

Report Date: 2/27/2024
Report No.: 696263 - PLM Rev #2, 2/28/2024
Project: Anchorage School District Spring Hill ES
Roof Replacement
Project No.: 2024-05

Client: HTR114

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727265
Client No.: SG0224-A32

Analyst Observation: White Insulation
Client Description: L1: White Chalky Insulation With
Black/Dark Blue "Hairs"

Location: Southwest Side of Generator
Room 127. Photo 71

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
3 Cellulose

Facility:
Percent Non-Fibrous Material:
97

Lab No.: 7727266
Client No.: SG0224-A33

Analyst Observation: White Insulation
Client Description: L1: Fluffy White Insulation Blanket

Location: Southwest Side of Generator
Room 127. Photo 71

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
100 Fibrous Glass

Facility:
Percent Non-Fibrous Material:
None Detected

Lab No.: 7727267
Client No.: SG0224-A34

Analyst Observation: Tan Ceiling Tile
Client Description: L1: (GCT1) 12"x12" Glued-On Ceiling
Tile

Location: North Side of MPR 130. Photo 85
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
37 Cellulose
17 Fibrous Glass

Percent Non-Fibrous Material:
46

Lab No.: 7727267(L2)
Client No.: SG0224-A34

Analyst Observation: Brown Mastic
Client Description: L2: Hard Dark Brown "Puck" Mastic

Location: North Side of MPR 130. Photo 85
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
1 Cellulose

Percent Non-Fibrous Material:
99

Lab No.: 7727268
Client No.: SG0224-A35

Analyst Observation: Tan Ceiling Tile
Client Description: L1: (GCT1) 12"x12" Glued-On Ceiling
Tile

Location: North Side of Art Classroom 145.
Photo 86

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
37 Cellulose
15 Fibrous Glass

Facility:
Percent Non-Fibrous Material:
48

Lab No.: 7727268(L2)
Client No.: SG0224-A35

Analyst Observation: Brown Mastic
Client Description: L2: Hard Dark Brown "Puck" Mastic

Location: North Side of Art Classroom 145.
Photo 86

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
1 Cellulose

Facility:
Percent Non-Fibrous Material:
99

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Analyst: Ellen Smith

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director



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CERTIFICATE OF ANALYSIS

Client: HTRW, LLC 11471 Business Blvd., #773442 Anchorage AK 99577	Report Date: 2/27/2024 Report No.: 696263 - PLM Project: Anchorage School District Spring Hill ES Roof Replacement Project No.: 2024-05	Rev #2, 2/28/2024
Client: HTR114		

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727273 Client No.: SG0224-A40	Analyst Observation: Tan Ceiling Tile Client Description: L1: (LCT1) 2'x4' Lay-In Ceiling Tile	Location: South Side of 4th-6th Resource Classroom 108. Photo 98 Facility: Percent Non-Fibrous Material: 48
<u>Percent Asbestos:</u> None Detected	<u>Percent Non-Asbestos Fibrous Material:</u> 37 Cellulose 15 Fibrous Glass	

Lab No.: 7727274 Client No.: SG0224-A41	Analyst Observation: Tan Ceiling Tile Client Description: L1: (LCT6) 2'x2' Lay-In Ceiling Tile	Location: South Side of 4th-6th Resource Classroom 108. Photo 99 Facility: Percent Non-Fibrous Material: 48
<u>Percent Asbestos:</u> None Detected	<u>Percent Non-Asbestos Fibrous Material:</u> 35 Cellulose 17 Fibrous Glass	

Lab No.: 7727275 Client No.: SG0224-A42	Analyst Observation: Tan Ceiling Tile Client Description: L1: (LCT1) 2'x4' Lay-In Ceiling Tile	Location: Southeast Side of 2nd-6th Extended Resource Classroom 116. Photo 104 Facility: Percent Non-Fibrous Material: 48
<u>Percent Asbestos:</u> None Detected	<u>Percent Non-Asbestos Fibrous Material:</u> 37 Cellulose 15 Fibrous Glass	

Lab No.: 7727276 Client No.: SG0224-A43	Analyst Observation: Tan Ceiling Tile Client Description: L1: (LCT7) 2'x2' Lay-In Ceiling Tile	Location: Southeast Side of 2nd-6th Extended Resource Classroom 116. Photo 105 Facility: Percent Non-Fibrous Material: 50
<u>Percent Asbestos:</u> None Detected	<u>Percent Non-Asbestos Fibrous Material:</u> 35 Cellulose 15 Fibrous Glass	

Lab No.: 7727277 Client No.: SG0224-A44	Analyst Observation: Tan Ceiling Tile Client Description: L1: (LCT4) 2'x4' Lay-In Ceiling Tile	Location: Southeast Side of 2nd-6th Extended Resource Classroom 116. Photo 106 Facility: Percent Non-Fibrous Material: 50
<u>Percent Asbestos:</u> None Detected	<u>Percent Non-Asbestos Fibrous Material:</u> 35 Cellulose 15 Fibrous Glass	

Please refer to the Appendix of this report for further information regarding your analysis.

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 Signature:
 Analyst: Ellen Smith

Approved By:
 Frank E. Ehrenfeld, III
 Laboratory Director



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CERTIFICATE OF ANALYSIS

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Client: HTR114	Project No.: 2024-05	

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727278 Client No.: SG0224-A46	Analyst Observation: Tan Ceiling Tile Client Description: L1: (LCT6) 2'x2' Lay-In Ceiling Tile	Location: Southeast Side of 2nd-6th Extended Resource Classroom 116. Photo 107 Facility: Percent Non-Fibrous Material: 46
Percent Asbestos: None Detected	Percent Non-Asbestos Fibrous Material: 37 Cellulose 17 Fibrous Glass	

Lab No.: 7727279 Client No.: SG0224-A46	Analyst Observation: Tan Ceiling Tile Client Description: L1: (LCT5) 2'x4' Lay-In Ceiling Tile	Location: Southwest Side of 2nd-6th Extended Resource Classroom 116. Photo 108 Facility: Percent Non-Fibrous Material: 48
Percent Asbestos: None Detected	Percent Non-Asbestos Fibrous Material: 37 Cellulose 15 Fibrous Glass	

Lab No.: 7727280 Client No.: SG0224-A47	Analyst Observation: Clear Cementitious Client Description: L1: Mixture of Beige Surface Layer and Dark Grey Base Layer	Location: From Damaged Area at East Side. Photo 109 Facility: Percent Non-Fibrous Material: 100
Percent Asbestos: None Detected	Percent Non-Asbestos Fibrous Material: None Detected	

Sample received wet

Lab No.: 7727280(L2) Client No.: SG0224-A47	Analyst Observation: Blue Mesh Client Description: L2: Blue Reinforcement Mesh	Location: From Damaged Area at East Side. Photo 109 Facility: Percent Non-Fibrous Material: 1
Percent Asbestos: None Detected	Percent Non-Asbestos Fibrous Material: 99 Synthetic	

Sample received wet

Lab No.: 7727281 Client No.: SG0224-A48	Analyst Observation: Lt Tan Drywall Client Description: L1: White Gypsum Board	Location: From Damaged Area of Exterior Wall. Photo 121 Facility: Percent Non-Fibrous Material: 83
Percent Asbestos: None Detected	Percent Non-Asbestos Fibrous Material: 15 Cellulose 2 Fibrous Glass	

Note: No joint compound present

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 2/13/2024
Date Analyzed: 02/19/2024
Signature:
Analyst: Ellen Smith

Approved By:
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Laboratory Director



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Client: HTR114		

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727282 Client No.: SG0224-A49	Analyst Observation: Tan Ceiling Tile Client Description: L1: (LCT1) 2'x4' Lay-In Ceiling Tile	Location: Southeast Side of K Classroom 162. Photo 120 Facility: Percent Non-Fibrous Material: 48
<u>Percent Asbestos:</u> <i>None Detected</i>	<u>Percent Non-Asbestos Fibrous Material:</u> 37 Cellulose 15 Fibrous Glass	
Lab No.: 7727283 Client No.: SG0224-A50	Analyst Observation: Tan Ceiling Tile Client Description: L1: (LCT6) 2'x2' Lay-In Ceiling Tile	Location: Southeast Side of 1st Classroom 170. Photo 126 Facility: Percent Non-Fibrous Material: 46
<u>Percent Asbestos:</u> <i>None Detected</i>	<u>Percent Non-Asbestos Fibrous Material:</u> 37 Cellulose 17 Fibrous Glass	
Lab No.: 7727284 Client No.: SG0224-A51	Analyst Observation: Tan Ceiling Tile Client Description: L1: (LCT3) 2'x4' Lay-In Ceiling Tile	Location: Southwest Side of 1st Classroom 170. Photo 127 Facility: Percent Non-Fibrous Material: 50
<u>Percent Asbestos:</u> <i>None Detected</i>	<u>Percent Non-Asbestos Fibrous Material:</u> 35 Cellulose 15 Fibrous Glass	
Lab No.: 7727285 Client No.: SG0224-A52	Analyst Observation: Tan Ceiling Tile Client Description: L1: (LCT1) 2'x4' Lay-In Ceiling Tile	Location: Northwest Side of 1st Classroom 171. Photo 129 Facility: Percent Non-Fibrous Material: 48
<u>Percent Asbestos:</u> <i>None Detected</i>	<u>Percent Non-Asbestos Fibrous Material:</u> 37 Cellulose 15 Fibrous Glass	
Lab No.: 7727286 Client No.: SG0224-A53	Analyst Observation: Tan Ceiling Tile Client Description: L1: (LCT6) 2'x2' Lay-In Ceiling Tile	Location: North Side of Staff Lounge 156. Photo 130 Facility: Percent Non-Fibrous Material: 48
<u>Percent Asbestos:</u> <i>None Detected</i>	<u>Percent Non-Asbestos Fibrous Material:</u> 35 Cellulose 17 Fibrous Glass	

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 2/13/2024
 Date Analyzed: 02/19/2024
 Signature:
 Analyst: Ellen Smith

Approved By:
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 Laboratory Director



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CERTIFICATE OF ANALYSIS

Client: HTRW, LLC
11471 Business Blvd., #773442
Anchorage AK 99577

Report Date: 2/27/2024
Report No.: 696263 - PLM Rev #2, 2/28/2024
Project: Anchorage School District Spring Hill ES
Roof Replacement
Project No.: 2024-05

Client: HTR114

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727287
Client No.: SG0224-A54
Analyst Observation: White Joint Compound
Client Description: L1: White Joint Compound
Location: Above Lay-In Ceiling From the North Side. Photo 131
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material:
None Detected None Detected Percent Non-Fibrous Material:
100

Note: Drywall not present.

Lab No.: 7727288
Client No.: SG0224-A55
Analyst Observation: Lt Tan Drywall
Client Description: L1: White Gypsum Board
Location: Above Lay-In Ceiling From the North Side. Photo 131
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material:
None Detected 1 Cellulose Percent Non-Fibrous Material:
99

Note: No joint compound present

Lab No.: 7727289
Client No.: SG0224-A56
Analyst Observation: Tan Ceiling Tile
Client Description: L1: (LCT2) 2'x4' Lay-In Ceiling Tile
Location: Southeast Side of Principal 149. Photo 133
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material:
None Detected 35 Cellulose Percent Non-Fibrous Material:
15 Fibrous Glass 50

Lab No.: 7727290
Client No.: SG0224-A57
Analyst Observation: Tan Ceiling Tile
Client Description: L1: (LCT1) 2'x4' Lay-In Ceiling Tile
Location: Southwest Side of Principal 149. Photo 132
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material:
None Detected 37 Cellulose Percent Non-Fibrous Material:
15 Fibrous Glass 48

Lab No.: 7727291
Client No.: SG0224-A58
Analyst Observation: Tan Ceiling Tile
Client Description: L1: (LCT5) 2'x4' Lay-In Ceiling Tile
Location: West Side of Main Office 148. Photo 134
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material:
None Detected 37 Cellulose Percent Non-Fibrous Material:
17 Fibrous Glass 46

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 2/13/2024
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Analyst: Ellen Smith

Approved By:
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11471 Business Blvd., #773442
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Report Date: 2/27/2024
Report No.: 696263 - PLM Rev #2, 2/28/2024
Project: Anchorage School District Spring Hill ES
Roof Replacement
Project No.: 2024-05

Client: HTR114

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727292	Analyst Observation: Tan Ceiling Tile	Location: West Side of Main Office 148.
Client No.: SG0224-A59	Client Description: L1: (LCT3) 2'x4' Lay-In Ceiling Tile	Photo 135
<u>Percent Asbestos:</u>	<u>Percent Non-Asbestos Fibrous Material:</u>	Facility:
<i>None Detected</i>	35 Cellulose	<u>Percent Non-Fibrous Material:</u>
	15 Fibrous Glass	50

Lab No.: 7727293	Analyst Observation: Tan Ceiling Tile	Location: West Side of Secretary Storage
Client No.: SG0224-A60	Client Description: L1: (LCT6) 2'x2' Lay-In Ceiling Tile	150. Photo 136
<u>Percent Asbestos:</u>	<u>Percent Non-Asbestos Fibrous Material:</u>	Facility:
<i>None Detected</i>	35 Cellulose	<u>Percent Non-Fibrous Material:</u>
	15 Fibrous Glass	50


Lab No.: 7727294	Analyst Observation: White Joint Compound	Location: From Damaged Area of Exterior
Client No.: SG0224-A61	Client Description: White Joint Compound	Wall. Photo 121
<u>Percent Asbestos:</u>	<u>Percent Non-Asbestos Fibrous Material:</u>	Facility:
<i>None Detected</i>	None Detected	<u>Percent Non-Fibrous Material:</u>
		100

Note: Drywall not present.


Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 2/13/2024

Date Analyzed: 02/19/2024

Signature: 

Analyst: Ellen Smith

Approved By: 

Frank E. Ehrenfeld, III
Laboratory Director



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Client: HTR114	

Appendix to Analytical Report

Customer Contact: Chris Ottosen

Method: 40 CFR Appendix E to Subpart E of Part 763, interim method for the Determination of Asbestos in Bulk Insulation Samples, USEPA 600, R93-116 and NYSDOH ELAP 198.1 as needed.

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

iATL Customer Service: customerservice@iatl.com
iATL Office Manager: wchampion@iatl.com
iATL Account Representative: House Account
Sample Login Notes: See Batch Sheet Attached
Sample Matrix: Bulk Building Materials
Exceptions Noted: See Following Pages

General Terms, Warrants, Limits, Qualifiers:

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at www.iATL.com and in our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA LAP LLC, or any agency of local, state or province governments nor of any agency of the U.S. government.

This report shall not be reproduced except in full, without written approval of the laboratory.

Information Pertinent to this Report:

Analysis by US EPA 600 93-116: Determination of Asbestos in Bulk Building Materials by Polarized Light Microscopy (PLM).

Certifications:

- NIST-NVLAP No. 101165-0
- NYSDOH-ELAP No. 11021
- AIHA-LAP, LLC No. 100188

Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. PC Trace represents a <0.25% amount. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.

Analytical Methodology Alternatives: Your initial request for analysis may not have accounted for recent advances in regulatory requirements or advances in technology that are routinely used in similar situations for other qualified projects. You may have the option to explore additional analysis for further information. Below are a few options, listed as the matrix followed by the appropriate methodology. Also included are links to more information on our website.

Bulk Building Materials that are Non-Friable Organically Bound (NOB) by Gravimetric Reduction techniques employing PLM and TEM: ELAP 198.6 (PLM-NOB), ELAP 198.4 (TEM-NOB) See additional information at the end of this appendix.



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Client: HTR114	

Loose Fill Vermiculite Insulation, Attic Insulation, Zonolite (copyright), etc.: US EPA 600 R-4/004 (multi-tiered analytical process)
Sprayed On Insulation/Fireproofing with Vermiculite (SOF-V): ELAP 198.8 (PLM-SOF-V)

Soil, sludge, sediment, aggregate, and like materials analyzed for asbestos or other elongated mineral particles (ex. erionite, etc.): ASTM D7521, CARB 435, and other options available

Asbestos in Surface Dust according to one of ASTM's Methods (very dependent on sampling collection technique – by TEM): ASTM D 5755, D5756, or D6480

Various other asbestos matrices (air, water, etc.) and analytical methods are available.

Disclaimers / Qualifiers:

There may be some samples in this project that have a "NOTE:" associated with a sample result. We use added disclaimers or qualifiers to inform the client about something that requires further explanation. Here is a list with highlighted disclaimers that may be pertinent to this project. For a full explanation of these and other disclaimers, please inquire at customerservice@iatl.com.

- 1) Note: No mastic provided for analysis.
- 2) Note: Insufficient mastic provided for analysis.
- 3) Note: Insufficient material provided for analysis.
- 4) Note: Insufficient sample provided for QC reanalysis.
- 5) Note: Different material than indicated on Sample Log / Description.
- 6) Note: Sample not submitted.
- 7) Note: Attached to asbestos containing material.
- 8) Note: Received wet.
- 9) Note: Possible surface contamination.
- 10) Note: Not building material. 1% threshold may not apply.
- 11) Note: Recommend TEM-NOB analysis as per EPA recommendations.
- 12) Note: Asbestos detected but not quantifiable.
- 13) Note: Multiple identical samples submitted, only one analyzed.
- 14) Note: Analyzed by EPA 600/R-93/116. Point Counting detection limit at 0.080%.
- 15) Note: Analyzed by EPA 600/R-93/116. Point Counting detection limit at 0.125%.
- 16) Note: This sample contains >10% vermiculite mineral. See Appendix for Recommendations for Vermiculite Analysis.

Recommendations for Vermiculite Analysis:

Several analytical protocols exist for the analysis of asbestos in vermiculite. These analytical approaches vary depending upon the nature of the vermiculite mineral being tested (e.g. un-processed gange, homogeneous exfoliated books of mica, or mixed mineral composites). Please contact your client representative for pricing and turnaround time options available.

iATL recommends initial testing using the EPA 600/R-93/116 method. This method is specifically designed for the analysis of asbestos in bulk building materials. It provides an acceptable starting point for primary screening of vermiculite for possible asbestos.

Results from this testing may be inconclusive. EPA suggests proceeding to a multi-tiered analysis involving wet separation techniques in conjunction with PLM and TEM gravimetric analysis (EPA 600/R-04/004).

For New York State customers, NYSDOH requires disclaimers and qualifiers for various vermiculite containing samples that direct analysis via ELAP198.6 and ELAP198.8 for samples that contain >10% vermiculite mineral where ELAP198.6 may be used to evaluate the asbestos content of the material. However, any test result using ELAP198.6 will be reported with the following disclaimer: "ELAP198.6 method does not remove vermiculite and may underestimate the level of asbestos present in a sample containing >10% vermiculite."

Further information on this method and other vermiculite and asbestos issues can be found at the following: Agency for Toxic Substances and Disease Registry (ATSDR) www.atsdr.cdc.gov, United States Geological Survey (USGS) www.minerals.usgs.gov/minerals/, US EPA www.epa.gov/asbestos. The USEPA also has an informative brochure "Current Best Practices for Vermiculite Attic Insulation" EPA 747F03001 May 2003, that may assist the health and remediation professional. NYS customers please follow current NYSDOH ELAP requirements per policy on subject of surfacing and vermiculite, May 6, 2016, Testing Requirements for Surfacing Material Containing Vermiculite (https://www.wadsworth.org/sites/default/files/WebDoc/1198_8_02_2.pdf)

The following is a summary of the analytical process outlines in the EPA 600/R-04/004 Method:

- 1) **Analytical Step/Method:** Initial Screening by PLM, EPA 600R-93/116
Requirements/Comments: Minimum of 0.1 g of sample. ~0.25% for most samples.



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CERTIFICATE OF ANALYSIS

Client: HTRW, LLC
11471 Business Blvd., #773442
Anchorage AK 99577

Report Date: 2/27/2024
Report No.: 696263 - PLM
Project: Anchorage School District Spring Hill ES
Roof Replacement
Project No.: 2024-05

Client: HTR114

2) **Analytical Step/Method:** Wet Separation by PLM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Sinks" only.

3) **Analytical Step/Method:** Wet Separation by PLM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Floats" only.

4) **Analytical Step/Method:** Wet Separation by TEM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Sinks" only.

5) **Analytical Step/Method:** Wet Separation by TEM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Suspension" only.
*With advance notice and confirmation by the laboratory.

**Approximately 1 Liter of sample in double-bagged container (~9x6 inch bag of sample).

New York State Department of Health requires that samples originating from NYS that they categorize as Non-friable Organically Bound materials can only be confirmed as None Detected for asbestos by method 198.4. See the table below for a list of those materials. (ENVIRONMENTAL LABORATORY APPROVAL PROGRAM CERTIFICATION MANUAL - ITEM No. 198.1, Revision Date 5/6/16)

*Asphalt Shingles, Caulking, Ceiling Tiles with Cellulose, Duct Wrap, Glazing, Mastic, Paint Chips, Resilient Floor Tiles, Rubberized Asbestos Gaskets, Siding Shingles, Vinyl Asbestos Tile, NOB materials (other than SM-V) with <10% vermiculite, Any material (Friable or NOB other than SM-V) with >10% vermiculite.

Statistically derived uncertainty with any measure should be taken into consideration when reviewing and interpreting all reported data and results. A more comprehensive listing of accuracy, precision, and uncertainty as it impacts this method is available upon request.

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CHAIN OF CUSTODY



Project Number	2024-05			Selected Laboratory	iATL
Project Name	Anchorage School District, Spring Hill Elementary School Roof Replacement			Shipping Method	FedEx, 7751 4382 7652
Address/Location	9911 Lake Otis Parkway, Anchorage, Alaska 99507			Date and Time	02/11/2024, 12:00 PM
Client	MCG Explore Design			Samples Received By	<i>[Signature]</i>
Inspector/Collected By	Christopher T. Ottosen			Date and Time	<i>[Signature]</i>
EPA B.I.# and State	TB14-124-18714/Alaska			Analyst Signature(s)	<i>[Signature]</i>
Collection Date	02/10/2024	Quantity	61	Turnaround	3-Day
Requested Analysis	Asbestos Bulk by PLM, EPA Method 600, R93-116				
Special Notes	E-mail results to cottosen@htrw-llc.com . Provide a scanned color copy of this chain of custody or return the original hard copies. Do not analyze wood, paint, or foam or perform composite analysis of gypsum wall board and joint compound unless specifically asked for in the sample description.				

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
SG0224-A01	L1: Grey gummy sealant used on various seams and intersections of the standing seam metal roofing components	Southeast corner of Roof F between the metal ridge flashing and the standing seam metal roofing panel	1	7727234
SG0224-A02	L1: White rubbery "repair" sealant used on the metal flashing pieces covering the seams of the ridge flashing	North side of Roof E from the ridge of Roof F above	2	7727235
SG0224-A03	L1: Grey gummy sealant used on various seams and intersections of the standing seam metal roofing components	North side of Roof E between the metal ridge flashing and the standing seam metal roofing panel on Roof F above	3	7727236
SG0224-A04	L1: Black EPDM-like membrane used at VTR penetration thru the standing seam metal roof	From VTR to the southeast of the boiler flue on Roof F	4	7727237
SG0224-A05	L1: Light grey spongy sealant commonly used with the EPDM-like membranes used at VTR penetrations and below the clerestory and louver "walls"	From VTR to the southeast of the boiler flue on Roof F	5	7727239
SG0224-A06	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	From seam on metal cover around the mechanical curb for the boiler flue on Roof F	7	7727230
SG0224-A07	L1: White gummy sealant used on various seams and intersections of the standing seam metal roofing components	From inside of the crimped "standing seam" of the standing seam metal roof just above the mechanical curb for the boiler flue	8	7727240

Analyzed - JSC & JAW
ANALYSED BY 2/28/24

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CHAIN OF CUSTODY



SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
SG0224-A08	L1: Light grey rubbery sealant used around louver and window penetrations thru the exterior EIFS L2: Grey cementitious plaster from EIFS	Northwest side of Roof E between the metal louver and EIFS siding	9	7727241
SG0224-A09	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	South side of Roof F at the metal flashing pieces covering the seams of the ridge flashing	10	7727242
SG0224-A10	L1: Light grey rubbery sealant used around louver and window penetrations thru the exterior EIFS	Northeast side of Roof A between the metal louver and metal drip edge	12	7727243
SG0224-A11	L1: Hard grey sealant used on the interior seams of the outside air intake louvers located close to the bird screen and possibly further into the ducts	Northeast side of Roof A smeared onto the bird screen inside of the louver fins	11	7727244
SG0224-A12	L1: Sticky black sealant used to adhere the EPDM-like membranes used at VTR penetrations and below the clerestory and louver "walls" to substrate	Northeast side of Roof A between EPDM-like membrane and metal flashing pieces at transition from the louver "wall" to the sloped roof below	13	7727245
SG0224-A13	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	Northwest side of Roof A above louvers on seam in metal "L" channel	14	7727245
SG0224-A14	L1: Hard black gasket used between the wire glass clerestory glazing and the metal window casing L2: Sticky gum-like sealant used between the wire glass clerestory glazing and the metal window casing	North side of Roof A from eastern-most clerestory windows	15	7727247
SG0224-A15	L1: Light grey rubbery sealant used around louver and window penetrations thru the exterior EIFS	North side of Roof A from above eastern-most clerestory windows	16	7727249
SG0224-A16	L1: Sticky gum-like sealant used between the wire glass clerestory glazing and the metal window casing	North side of Roof A from central clerestory windows	17	7727249
SG0224-A17	L1: Grey gummy sealant used on various seams and intersections of the standing seam metal roofing components	North side of Roof A between the metal ridge flashing and the standing seam metal roofing panel below the central clerestory windows	18	7727250
SG0224-A18	L1: Sticky black sealant used to adhere the EPDM-like membranes used at VTR penetrations and below the clerestory and louver "walls" to substrate	North side of Roof A between EPDM-like membrane and metal flashing pieces at transition from the clerestory "wall" to the sloped roof below	19	7727251
SG0224-A19	L1: Hard black gasket used between the wire glass clerestory glazing and the metal window casing L2: Sticky gum-like sealant used between the wire glass clerestory glazing and the metal window casing	North side of Roof A from above western-most clerestory windows	20	7727252

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CHAIN OF CUSTODY



SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
SG0224-A20	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	Southeast corner of Roof D on bent metal flashing at the end of the ridge	21	7727253
SG0224-A21	L1: Dark red gummy sealant used on various seams and intersections of the standing seam metal roofing components	From inside of the crimped "standing seam" of the standing seam metal roof edge on the north side of Roof F to the east of the "jog" above the covered entryway below	22	7727254
SG0224-A22	L1: Light grey gummy sealant used on various seams and intersections of the standing seam metal roofing components	From between the standing seam metal roof panel and metal drip edge/apron on the north side of Roof F to the east of the "jog" above the covered entryway below	23	7727255
SG0224-A23	L1: Off-white gum-like putty used at duct flanges of supply air, return air, and outside air systems	Between the outside air intake duct flange and the metal duct flange for the flexible duct connector to AHU-2 on the northeast side of the West Fan Room 254	43	7727256
SG0224-A24	L1: Hard white chalky insulation with brown specks inside of the "attic" doors used for the fan rooms	From exposed insulation on the bottom right of the "attic" door for the East Fan Room 233	45	7727257
SG0224-A25	L1: Off-white gum-like putty used at duct flanges of supply air, return air, and outside air systems	Between the outside air intake duct flange and the duct flange connected to AHU-3 on the southeast side of East Fan Room 233	47	7727258
SG0224-A26	L1: White joint compound	South wall of East Fan Room 233 from unpainted area of gypsum board	60	7727259
SG0224-A27	L1: White gypsum board	South wall of East Fan Room 233 from unpainted area of gypsum board	60	7727260
SG0224-A28	L1: White joint compound	Southwest corner of East Fan Room 233 from painted gypsum board	61	7727261
SG0224-A29	L1: White gypsum board	South wall of East Fan Room 233 from hole in the painted gypsum board	62	7727262
SG0224-A30	L1: White chalky insulation with small gold flakes used inside of the generator exhaust stack	Southwest side of Generator Room 127	69	7727263
SG0224-A31	L1: Tan-brown flange gasket used between the generator muffler and exhaust stack	Southwest side of Generator Room 127	70	7727264
SG0224-A32	L1: White chalky insulation with black/dark blue "hairs" used as the outer insulation layer inside of the generator muffler	Southwest side of Generator Room 127	71	7727265
SG0224-A33	L1: Fluffy white insulation blanket used as the inner insulation layer inside of the generator muffler	Southwest side of Generator Room 127	71	7727266

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SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
SG0224-A34	L1: (GCT1) 12" x 12" glued-on ceiling tile with 3/16"-1/4" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; only style of "non-repair tile" used throughout the school L2: Hard dark brown "puck" mastic used to adhere GCT1 to substrates	North side of MPR 130	85	7727267
SG0224-A35	L1: (GCT1) 12" x 12" glued-on ceiling tile with 3/16"-1/4" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; only style of "non-repair tile" used throughout the school L2: Hard dark brown "puck" mastic used to adhere GCT1 to substrates L3: Pliable tan "puck" mastic used to adhere GCT1 to substrates	North side of Art Classroom 145	86	7727265
SG0224-A36	L1: (LCT4) 2' x 4' lay-in ceiling tile with 1/8" wide x 1/8"-1/4" long random fissures and 1/32"-1/8" holes; common "patch" tile	North side of 6 th Classroom 101	88	7727263
SG0224-A37	L1: (LCT5) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1/4" long directional fissures and 1/32"-1/16" holes; common "patch" tile	North side of 6 th Classroom 101	89	7727270
SG0224-A38	L1: (LCT2) 2' x 4' lay-in ceiling tile with 1/8"-3/16" oblong holes and 1/16" holes; uncommon "patch" tile	North side of 6 th Classroom 101	96	7727271
SG0224-A39	L1: (LCT7) 2' x 2' lay-in ceiling tile with 1/8" wide x 1/8"-1/4" long random fissures and 1/32"-1/8" holes; occasionally used at the classroom VAV outlets	North side of 6 th Classroom 101	97	7727272
SG0224-A40	L1: (LCT1) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 4' lay-in ceiling tile in school	South side of 4 th -6 th Resource Classroom 108	98	7727273
SG0224-A41	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	South side of 4 th -6 th Resource Classroom 108	99	7727274
SG0224-A42	L1: (LCT1) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 4' lay-in ceiling tile in school	Southeast side of 2 nd -6 th Extended Resource Classroom 116	104	7727275
SG0224-A43	L1: (LCT7) 2' x 2' lay-in ceiling tile with 1/8" wide x 1/8"-1/4" long random fissures and 1/32"-1/8" holes; occasionally used at the classroom VAV outlets	Southeast side of 2 nd -6 th Extended Resource Classroom 116	105	7727276
SG0224-A44	L1: (LCT4) 2' x 4' lay-in ceiling tile with 1/8" wide x 1/8"-1/4" long random fissures and 1/32"-1/8" holes; common "patch" tile	Southeast side of 2 nd -6 th Extended Resource Classroom 116	106	7727277

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CHAIN OF CUSTODY



SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
SG0224-A45	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	Southeast side of 2 nd -6 th Extended Resource Classroom 116	107	7727273
SG0224-A46	L1: (LCT5) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long directional fissures and 1/32"-1/16" holes; common "patch" tile	Southwest side of 2 nd -6 th Extended Resource Classroom 116	108	7727273
SG0224-A47	L1: Mixture of beige surface layer and dark grey base layer from exterior EIFS L2: Blue reinforcement mesh from exterior EIFS **DO NOT ANALYZE THE STYROFOAM**	From damaged area at east side of the exterior soffit outside of Entry 300B	109	772728J
SG0224-A48	L1: White gypsum board	From damaged area of exterior wall above the lay-in ceiling at the southeast side of K Classroom 162	121	772728L
SG0224-A49	L1: (LCT1) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 4' lay-in ceiling tile in school	Southeast side of K Classroom 162	120	7727282
SG0224-A50	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	Southeast side of 1 st Classroom 170	126	7727283
SG0224-A51	L1: (LCT3) 2' x 4' lay-in ceiling tile with 3/16" wide x 3/16"-1/2" long semi-directional fissures and 1/16" holes; very uncommon tile in the building	Southwest side of 1 st Classroom 170	127	7727284
SG0224-A52	L1: (LCT1) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 4' lay-in ceiling tile in school	Northwest side of 1 st Classroom 171	129	7727285
SG0224-A53	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	North side of Staff Lounge 156 at 90 degree bend in wall	130	7727286
SG0224-A54	L1: White joint compound	Above the lay-in ceiling from the north side of Staff Lounge 156 at 90 degree bend in wall	131	7727287
SG0224-A55	L1: White gypsum board	Above the lay-in ceiling from the north side of Staff Lounge 156 at 90 degree bend in wall	131	7727288
SG0224-A56	L1: (LCT2) 2' x 4' lay-in ceiling tile with 1/8"-3/16" oblong holes and 1/16" holes; uncommon "patch" tile	Southeast side of Principal 149	133	7727288



CHAIN OF CUSTODY

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 (907)-917-3801

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
SG0224-A57	L1: (LCT1) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 4' lay-in ceiling tile in school	Southwest side of Principal 149	132	7727290
SG0224-A58	L1: (LCT5) 2' x 4' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long directional fissures and 1/32"-1/16" holes; common "patct" tile	West side of Main Office 148	134	7727291
SG0224-A59	L1: (LCT3) 2' x 4' lay-in ceiling tile with 3/16" wide x 3/16"-1" long semi-directional fissures and 1/16" holes; very uncommon tile in the building	West side of Main Office 148	135	7727292
SG0224-A60	L1: (LCT6) 2' x 2' lay-in ceiling tile with 1/8"-3/16" wide x 1/4"-1" long random fissures and 1/32"-1/8" holes; main 2' x 2' lay-in ceiling tile in school	West side of Secretary Storage 150	136	7727293
SG0224-A61	L1: White joint compound	From damaged area of exterior wall above the lay-in ceiling at the southeast side of K Classroom 162	121	7727294

--END--



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CERTIFICATE OF ANALYSIS

Client: HTRW, LLC
11471 Business Blvd., #773442
Anchorage AK 99577

Report Date: 2/27/2024
Report No.: 696263 - TEM NOB Rev #2, 2/28/2024
Project: Anchorage School District Spring Hill ES
Roof Replacement
Project No.: 2024-05

Client: HTR114


TEM BULK SAMPLE ANALYSIS SUMMARY


Lab No.: 7727243
Client No.: SG0224-A10
Description: Lt Grey Sealant
% Asbestos Detected:
None Detected

Facility:
Location: Northeast Side of Roof A . Photo 12
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 44.3 %
Gravimetrically Reduced Subsample: 55.7%
% Non-Fibrous Material:
55.7 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 2/13/2024
Date Analyzed: 02/27/2024
Signature: 
Analyst: Patrick Carr

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director



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Client: HTRW, LLC
11471 Business Blvd., #773442
Anchorage AK 99577

Report Date: 2/27/2024
Report No.: 696263 - TEM NOB Rev #2, 2/28/2024
Project: Anchorage School District Spring Hill ES
Roof Replacement
Project No.: 2024-05

Client: HTR114


TEM BULK SAMPLE ANALYSIS SUMMARY


Lab No.: 7727245
Client No.: SG0224-A12
Description: Black Sealant
% Asbestos Detected:
None Detected

Facility:
Location: Northeast Side of Roof A. Photo 13
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 93.2 %
Gravimetrically Reduced Subsample: 6.8%
% Non-Fibrous Material:
6.8 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 2/13/2024
Date Analyzed: 02/27/2024
Signature: 
Analyst: Patrick Carr

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director



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Client: HTRW, LLC
11471 Business Blvd., #773442
Anchorage AK 99577

Report Date: 2/27/2024
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Project: Anchorage School District Spring Hill ES
Roof Replacement
Project No.: 2024-05

Client: HTR114

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727247
Client No.: SG0224-A14
Description: Black Gasket
% Asbestos Detected:
0.3 Chrysotile

Facility:
Location: North Side of Roof A. Photo 15
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 94.7 %
Gravimetrically Reduced Subsample: 5.3%
% Non-Fibrous Material:
5.0 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 2/13/2024
Date Analyzed: 02/27/2024
Signature:
Analyst: Patrick Carr

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director



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CERTIFICATE OF ANALYSIS

Client: HTRW, LLC
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Report Date: 2/27/2024
Report No.: 696263 - TEM NOB Rev #2, 2/28/2024
Project: Anchorage School District Spring Hill ES
Roof Replacement
Project No.: 2024-05


Client: HTR114

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727247(L2) Client No.: SG0224-A14 Description: Black Sealant % Asbestos Detected: 0.4 Chrysotile	Facility: Location: North Side of Roof A. Photo 15 % Non-Asbestos Fibrous Material: None Detected	Organic Fraction: 62.9 % Gravimetrically Reduced Subsample: 37.1% % Non-Fibrous Material: 36.7 Other
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Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 2/13/2024
Date Analyzed: 02/28/2024
Signature: 
Analyst: Craig Liska

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director



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Report Date: 2/27/2024
Report No.: 696263 - TEM NOB Rev #2, 2/28/2024
Project: Anchorage School District Spring Hill ES
Roof Replacement
Project No.: 2024-05

Client: HTR114

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727258
Client No.: SG0224-A25
Description: White Putty
% Asbestos Detected:
*Trace Chrysotile, Detected at
<0.25%*

Facility:
Location: Between the Outside Air Intake Duct
Flange. Photo 47
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 72.1 %
Gravimetrically Reduced Subsample: 27.9%
% Non-Fibrous Material:
27.9 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 2/13/2024
Date Analyzed: 02/27/2024
Signature:
Analyst: Patrick Carr

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director



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CERTIFICATE OF ANALYSIS


Client: HTRW, LLC 11471 Business Blvd., #773442 Anchorage AK 99577	Report Date: 2/27/2024 Report No.: 696263 - TEM NOB Rev #2, 2/28/2024 Project: Anchorage School District Spring Hill ES Roof Replacement Project No.: 2024-05
Client: HTR114	

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7727268(L2) Client No.: SG0224-A35 Description: Brown Mastic % Asbestos Detected: <i>None Detected</i>	Facility: Location: North Side of Art Classroom 145. Photo 86 <u>% Non-Asbestos Fibrous Material:</u> Trace SiAl, Other Fiber	Organic Fraction: 49.5 % Gravimetrically Reduced Subsample: 50.5% <u>% Non-Fibrous Material:</u> 50.5 Other
Lab No.: 7727268(L3) Client No.: SG0224-A35 Description: Lt Tan Mastic % Asbestos Detected: <i>None Detected</i>	Facility: Location: North Side of Art Classroom 145. Photo 86 <u>% Non-Asbestos Fibrous Material:</u> Trace SiAl, Other Fiber	Organic Fraction: 2.9 % Gravimetrically Reduced Subsample: 102.9% <u>% Non-Fibrous Material:</u> 102.9 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 2/13/2024
Date Analyzed: 02/28/2024
Signature: 
Analyst: Craig Liska

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director



9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: HTRW, LLC
11471 Business Blvd., #773442
Anchorage AK 99577

Report Date: 2/27/2024
Report No.: 696263 - TEM NOB
Project: Anchorage School District Spring Hill ES
Roof Replacement
Project No.: 2024-05

Client: HTR114

Appendix to Analytical Report:

Customer Contact: Chris Ottosen
Analysis: ELAP Section 198.4

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

iATL Customer Service: customerservice@iatl.com
iATL Office Manager: wchampion@iatl.com
iATL Account Representative: House Account
Sample Login Notes: See Batch Sheet Attached
Sample Matrix: Bulk material, Non-Friable Organically Bound material such as VSF, FT, M, RM, Tar, CB, Shingle, Tar Paper, Caulk, Glazing
Exceptions Noted: See Following Pages

General Terms, Warrants, Limits, Qualifiers:

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at www.iATL.com and in our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA LAP LLC, or any agency of local, state or province governments nor of any agency of the U.S. government.

This report shall not be reproduced except in full, without written approval of the laboratory.

Information Pertinent to this Report:

Analysis by ELAP Section 198.4

Certifications:

- NIST-NVLAP No. 101165-0
- NYSDOH-ELAP No. 11021
- AIHA-LAP, LLC No. 100188

All results are based on the samples as received at the lab. iATL assumes that appropriate sampling methods have been used and that the data upon which these results are based have been accurately supplied by the client.

The "Gravimetrically Reduced Subsample" is the portion of the submitted sample remaining following the ashing and acid treatment processes. TEM analysis occurs on this portion of the sample.

Final results are calculated to represent the sample as submitted. Results are verifiable for only those operations and analyses performed in the laboratory.



9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: HTRW, LLC
11471 Business Blvd., #773442
Anchorage AK 99577

Report Date: 2/27/2024
Report No.: 696263 - TEM NOB
Project: Anchorage School District Spring Hill ES
Roof Replacement
Project No.: 2024-05

Client: HTR114

Disclaimers / Qualifiers:

There may be some samples in this project that have a "NOTE:" associated with a sample result. We use added disclaimers or qualifiers to inform the client about something that requires further explanation. Here is a complete list with highlighted disclaimers pertinent to this project. For a full explanation of these and other disclaimers, please inquire at customerservice@iatl.com.

- (1)Note: Sample not analyzed.
- (2)Note: Sample not analyzed at request of client.
- (3)Note: Sample analysis terminated. Clearance criteria exceeded (average >70.0 s/mm²). Set fails by AHERA 40 CFR 763.
- (4)Note: Heavy loading (>0.1 s/cc) of non-asbestos particulate that might prohibit the required morphological, diffraction and elemental identification of asbestos. The absence of asbestos on the sample can not be concluded. Analysis for informational purposes only.
- (5)Note: Heavy loading (>10% per grid opening) non-fibrous particulate. Sample analysis terminated. Clearance criteria exceeded (>10%). Sample voided by AHERA 40 CFR 763.
- (5A)Note: Heavy loading (>25% per grid opening) non-fibrous particulate. Sample analysis terminated. Clearance criteria exceeded (>25%). Sample voided by NIOSH 7402.
- (6)Note: Sample turbidity >1.0 NTU. Therefore MDL >> 0.1 MFL. Does not meet National Primary Drinking Water Standards.
- (7)Note: Sample integrity compromised. Received sample cassette with top open (40 CFR 763 c-e).
- (8)Note: Received sample cassettes with portion of filter missing. "PCM re-prep"
- (9)Note: Void - overloaded, unable to prep.
- (10)Note: Void - filter damaged.
- (11)Note: No volume supplied.
- (12)Note: Heavy loading (>0.1 s/cc) of non-asbestos / non-fibrous particulate.
- (13)Note: Method analytical sensitivity of <0.003 s/cc not attained due to volume of air sampled. NIOSH requires a minimum of 400L.
- (13A)Note: Volume does not meet AHERA requirements.(<1188 L)
- (14)Note: Geometric Mean = 0.xxxx Structures/cc
- (15)Note: Samples received on 0.8 micron PCM filters. Samples must be submitted on 0.45 micron filter cassettes per AHERA guidelines
- (18)Note: *Results are for informational purposes only. Samples received on 0.8um PCM cassettes. Per AHERA 40 CFR 763 guidelines samples must be obtained on a 0.45um cassette.
- (TEM NOB 1) Note: The above result represents only the analysis of NOB-residue submitted from the client.
- (TEM NOB 2) Note: Insufficient material (<100mg) to verify results.

Appendix A.3 – Laboratory Accreditations

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 600340-0

Alaska Asbestos Laboratory
Anchorage, AK

is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:


Asbestos Fiber Analysis

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).*

2024-01-01 through 2024-12-31

Effective Dates




For the National Voluntary Laboratory Accreditation Program

**National Voluntary
Laboratory Accreditation Program**



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Alaska Asbestos Laboratory
3633 Parsons Avenue
Anchorage, AK 99508
Joel Hicklin
Phone: 907-884-0478
Email: plmlaboratoryjth@yahoo.com

ASBESTOS FIBER ANALYSIS

NVLAP LAB CODE 600340-0

Bulk Asbestos Analysis

<u>Code</u>	<u>Description</u>
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

A handwritten signature in blue ink, appearing to read 'Dana S. Laman', is written over a horizontal line.

For the National Voluntary Laboratory Accreditation Program

**National Voluntary
Laboratory Accreditation Program**



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

International Asbestos Testing Laboratories

9000 Commerce Parkway
Suite B
Mt. Laurel, NJ 08054
Mr. Frank E. Ehrenfeld III
Phone: 856-231-9449 Fax: 856-231-9818
Email: frankehrenfeld@iatl.com
<http://www.iatl.com>

ASBESTOS FIBER ANALYSIS

NVLAP LAB CODE 101165-0

Bulk Asbestos Analysis

<u>Code</u>	<u>Description</u>
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

<u>Code</u>	<u>Description</u>
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

A handwritten signature in blue ink, which appears to read 'Dana S. Laman'. The signature is written in a cursive style and is positioned above a horizontal line.

For the National Voluntary Laboratory Accreditation Program

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 101165-0

International Asbestos Testing Laboratories

Mt. Laurel, NJ

is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).*

2023-07-01 through 2024-06-30

Effective Dates



For the National Voluntary Laboratory Accreditation Program

Appendix A.4 – Asbestos Inspector Certifications



1310 E 66th Avenue, Suite 2- Anchorage, AK 99518 - 907.332.0456



Certificate of Training

This is to certify that

Christopher T Ottosen

Has Attended and Successfully Completed
**Building Inspector Refresher
4 Hour Course**

This course is fully accredited by the Alabama Department of Environmental Management (ADEM) in compliance with TSCA Title II. This course is a synchronous and online course.

Certificate Number: TBI4-124-18714

Expiration Date: 1/18/2025

Alan Caldwell
Principal Instructor

1/18/2024

Exam Date:

1/18/2024

Course Date:

Appendix B - Lead

Appendix B.1 – Table of XRF Readings

Appendix B.1 – Table of XRF Readings

SciApps X-550, Serial No. 00528

HTRW, LLC, Christopher T. Ottosen
September 16, 2022

RESULTS OF XRF TESTING

READING NUMBER	FLOOR	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	Lead (Pb) mg/cm2	+/- ERROR
1	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	1.051	0.034
2	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	1.042	0.034
3	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	1.010	0.033
4	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	1.034	0.019
5	FIRST	BOILER ROOM 117	COLUMN	METAL	LIGHT PINK	INTACT	0.001	0.001
6	FIRST	BOILER ROOM 117	CROSS BRACE	METAL	LIGHT PINK	INTACT	0.001	0.001
7	FIRST	BOILER ROOM 117	WALL	CONCRETE BLOCK	LIGHT PINK	INTACT	0.000	0.001
8	FIRST	BOILER ROOM 117	BEAM	METAL	LIGHT PINK	INTACT	0.001	0.001
9	FIRST	BOILER ROOM 117	WALL	GYPSUM BOARD	LIGHT PINK	INTACT	0.000	0.001
10	FIRST	BOILER ROOM 117	CEILING	GYPSUM BOARD	LIGHT PINK	INTACT	0.000	0.001
11	FIRST	BOILER ROOM 117	INSULATION WRAP	CLOTH	BEIGE	INTACT	0.000	0.001
12	FIRST	BOILER ROOM 117	WALL	GYPSUM BOARD	LIGHT PINK	INTACT	0.001	0.001
13	FIRST	BOILER ROOM 117	PLATE ON CROSS BRACE	METAL	LIGHT PINK	INTACT	0.001	0.001
14	FIRST	GENERATOR ROOM 127	GENERATOR CONTROL PANEL	METAL	GREEN	INTACT	0.000	0.001
15	FIRST	GENERATOR ROOM 127	GENERATOR ALTERNATOR COVER	METAL	GREEN	INTACT	0.001	0.001
16	FIRST	GENERATOR ROOM 127	GENERATOR ENGINE BLOCK	METAL	GREEN	INTACT	0.001	0.001
17	FIRST	GENERATOR ROOM 127	GENERATOR BASE FRAME	METAL	GREEN	INTACT	0.000	0.001
18	FIRST	GENERATOR ROOM 127	GENERATOR RADIATOR COVER	METAL	GREEN	INTACT	-0.001	0.001
19	FIRST	GENERATOR ROOM 127	DAY TANK CONTAINMENT	METAL	WHITE	INTACT	0.000	0.001
20	FIRST	GENERATOR ROOM 127	DAY TANK	METAL	WHITE	INTACT	0.001	0.001
21	FIRST	KITCHEN 129	FLOOR	QUARRY TILE	BROWN-RED	INTACT	0.001	0.001
22	FIRST	KITCHEN 129	WALL	CONCRETE BLOCK	WHITE	INTACT	0.000	0.001

2024-05-Anchorage School District,
Spring Hill Elementary School Roof Replacement
9911 Lake Otis Parkway, Anchorage, Alaska 99507

Appendix B.2

SciApps X-550, Serial No. 00528

HTRW, LLC, Christopher T. Ottosen
September 16, 2022

RESULTS OF XRF TESTING

READING NUMBER	FLOOR	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	Lead (Pb) mg/cm2	+/- ERROR
23	FIRST	KITCHEN 129	CEILING	GYPSUM BOARD	WHITE	INTACT	0.000	0.001
24	FIRST	KITCHEN 129	ACCESS DOOR IN CEILING	METAL	WHITE	INTACT	0.000	0.001
25	FIRST	KITCHEN 129	FRAME FOR ACCESS DOOR IN CEILING	METAL	WHITE	AREAS OF FRICTION WEAR	0.000	0.001
26	SECOND	EAST FAN ROOM 233	ATTIC DOOR	WOOD	WHITE	INTACT	0.001	0.001
27	SECOND	EAST FAN ROOM 233	FRAME FOR ATTIC DOOR	METAL	BROWN-RED	INTACT	0.000	0.002
28	SECOND	EAST FAN ROOM 233	LADDER RUNG	METAL	BLACK	INTACT	0.001	0.002
29	SECOND	EAST FAN ROOM 233	HANDRAIL	METAL	BROWN	CHIPS AND SCRAPES	0.004	0.003
30	SECOND	EAST FAN ROOM 233	WALL	GYPSUM BOARD	LIGHT PINK	INTACT	0.001	0.001
31	SECOND	EAST FAN ROOM 233	FLANGE AT EXHAUST DUCT PENETRATION THRU WALL	METAL	LIGHT PINK	INTACT	0.005	0.003
32	SECOND	EAST FAN ROOM 233	SOLDER ON DRAIN PIPING FOR GLYCOL CATCH BASIN	METAL	SILVER	INTACT	0.001	0.001
33	SECOND	EAST FAN ROOM 233	SOLDER AT GLYCOL SUPPLY LINE AND VALVE CONNECTION	METAL	SILVER	INTACT	0.336	0.096
34	SECOND	EAST FAN ROOM 233	AHU-4	METAL	DARK GREY	INTACT	0.004	0.003
35	FIRST	MPR 130	WALL	GYPSUM BOARD	WHITE	INTACT	0.002	0.001
36	FIRST	ART CLASSROOM 145	FINTUBE COVER	METAL	WHITE	INTACT	0.002	0.002
37	FIRST	ART CLASSROOM 145	RETAINER STRIP BETWEEN FINTUBE COVER SECTIONS	METAL	WHITE	INTACT	0.010	0.004
38	FIRST	ART CLASSROOM 145	WALL	GYPSUM BOARD	WHITE	INTACT	0.000	0.001
39	FIRST	ART CLASSROOM 145	TRIM AROUND TACKBOARD	WOOD	WHITE	INTACT	0.002	0.001
40	FIRST	ART CLASSROOM 145	TACKBOARD	TACKBOARD	BROWN	INTACT	0.000	0.001
41	FIRST	ART CLASSROOM 145	WINDOW SILL	FORMICA	PINKISH	INTACT	0.081	0.010
42	FIRST	ART CLASSROOM 145	CORNER GUARD ON WINDOW SILL	PLASTIC	BEIGE	INTACT	0.002	0.001
43	FIRST	ART CLASSROOM 145	BLINDS	METAL	BEIGE	INTACT	0.001	0.001
44	FIRST	ART CLASSROOM 145	WINDOW CASING	METAL	BLUE	INTACT	0.001	0.001

2024-05-Anchorage School District,
Spring Hill Elementary School Roof Replacement
9911 Lake Otis Parkway, Anchorage, Alaska 99507

Appendix B.2

SciApps X-550, Serial No. 00528

HTRW, LLC, Christopher T. Ottosen
September 16, 2022

RESULTS OF XRF TESTING

READING NUMBER	FLOOR	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	Lead (Pb) mg/cm2	+/- ERROR
45	FIRST	ART CLASSROOM 145	WINDOW MULLION	METAL	BLUE	INTACT	0.004	0.001
46	FIRST	ART CLASSROOM 145	DOOR	METAL	WHITE	INTACT	-0.001	0.001
47	FIRST	ART CLASSROOM 145	DOOR FRAME	METAL	WHITE	INTACT	0.000	0.001
48	FIRST	ART CLASSROOM 145	WALL	GYPSUM BOARD	WHITE	INTACT	-0.001	0.001
49	FIRST	ART CLASSROOM 145	COVE BASE	VINYL	TAN	INTACT	0.002	0.001
50	FIRST	ART CLASSROOM 145	FLOOR	TERRAZZO	PINKISH	INTACT	0.000	0.001
51	FIRST	ART CLASSROOM 145	FLOORING DIVIDING STRIPS	METAL	SILVER	INTACT	-0.001	0.001
52	FIRST	ART CLASSROOM 145	CONTROL JOINT IN FLOORING	RUBBER-LIKE	BLACK	INTACT	0.008	0.007
53	FIRST	STORAGE 151	12" X 12" FLOOR TILE	VINYL	BEIGE	INTACT	0.001	0.001
54	FIRST	STORAGE 151	CEILING	GYPSUM BOARD	OFF-WHITE	INTACT	0.000	0.001
55	FIRST	KINDERGARTEN CLASSROOM 164	LAMINATE "WOOD" PLANK FLOORING	VINYL	BROWN	INTACT	0.000	0.001
56	FIRST	KINDERGARTEN CLASSROOM 164	CABINET DOOR	FORMICA	PINKISH	INTACT	0.000	0.001
57	FIRST	KINDERGARTEN CLASSROOM 164	HANDLE FOR CABINET DOOR	PLASTIC	BEIGE	INTACT	0.001	0.001
58	FIRST	KINDERGARTEN CLASSROOM 164	COUNTERTOP	FORMICA	PINKISH	INTACT	-0.001	0.001
59	FIRST	KINDERGARTEN CLASSROOM 164	"COUNTERTOP" OVER FINITUBE SPACE	FORMICA	PINKISH	INTACT	0.000	0.001
60	FIRST	KINDERGARTEN CLASSROOM 164	WINDOW CASING	METAL	BLUE	INTACT	0.001	0.001
61	FIRST	KINDERGARTEN CLASSROOM 164	WINDOW MULLION	METAL	BLUE	INTACT	0.001	0.001
62	FIRST	KINDERGARTEN CLASSROOM 164	WALL	WALL PAPER/ GYPSUM BOARD	WHITE	INTACT	0.014	0.004
63	FIRST	IMC 144	STUB WALL	GYPSUM BOARD	WHITE	INTACT	0.001	0.001
64	FIRST	IMC 144	COUNTERTOP	FORMICA	PINKISH	INTACT	0.049	0.007
65	FIRST	IMC 144	"COUNTERTOP" OVER FINITUBE SPACE	FORMICA	PINKISH	INTACT	0.049	0.008
66	FIRST	IMC 144	TRIM ON FACE OF SHELVING	PLASTIC	OFF-WHITE	INTACT	0.000	0.001

2024-05-Anchorage School District,
Spring Hill Elementary School Roof Replacement
9911 Lake Otis Parkway, Anchorage, Alaska 99507

Appendix B.2

SciApps X-550, Serial No. 00528

HTRW, LLC, Christopher T. Ottosen
September 16, 2022

RESULTS OF XRF TESTING

READING NUMBER	FLOOR	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	Lead (Pb) mg/cm2	+/- ERROR
67	FIRST	IMC 144	SHELF	FORMICA	OFF-WHITE	INTACT	0.001	0.001
68	FIRST	IMC 144	COVE BASE	VINYL	BLACK	INTACT	0.250	0.137
69	FIRST	IMC 144	FLOOR	CARPET	VARIES	INTACT	-0.001	0.001
70	ROOF LEVEL	EXTERIOR	ROOF PANEL	METAL	RED	INTACT	0.002	0.001
71	ROOF LEVEL	EXTERIOR	FLASHING AT EDGE OF ROOF	METAL	RED	INTACT	0.002	0.001
72	ROOF LEVEL	EXTERIOR	FASCIA PANEL	METAL	RED	INTACT	0.003	0.001
73	ROOF LEVEL	EXTERIOR	RETAINER FOR SOFFIT VENT	METAL	RED	INTACT	0.003	0.001
74	ROOF LEVEL	EXTERIOR	SOFFIT VENT	METAL	RED	INTACT	0.000	0.001
75	ROOF LEVEL	EXTERIOR	WALL	EIFS	BEIGE	INTACT	0.002	0.001
76	GROUND LEVEL	EXTERIOR	WALL	EIFS	BEIGE	INTACT	0.001	0.001
77	GROUND LEVEL	EXTERIOR	DOOR	METAL	BEIGE	INTACT	0.002	0.001
78	GROUND LEVEL	EXTERIOR	DOOR FRAME	METAL	BEIGE	INTACT	0.001	0.001
79	GROUND LEVEL	EXTERIOR	LOUVER	METAL	BEIGE	INTACT	0.004	0.003
80	GROUND LEVEL	EXTERIOR	LOUVER FIN	METAL	BEIGE	INTACT	0.001	0.001
81	GROUND LEVEL	EXTERIOR	COLUMN	METAL	BEIGE	INTACT	0.000	0.001
82	GROUND LEVEL	EXTERIOR	DOOR FRAME	METAL	BEIGE	CHIPS AND SCRAPES	0.000	0.001
83	GROUND LEVEL	EXTERIOR	BOLLARD	METAL	YELLOW	INTACT	0.189	0.084
84	GROUND LEVEL	EXTERIOR	TRANSFORMER PM3141	METAL	GREEN	INTACT	-0.001	0.001
85	GROUND LEVEL	EXTERIOR	TRANSFORMER CUTLER-HAMMER	METAL	GREY	WEATHERED	0.020	0.005
86	GROUND LEVEL	EXTERIOR	HANDRAIL	METAL	RED	POOR, DELAMINATING	0.084	0.014
87	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	1.037	0.033
88	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	0.997	0.032

2024-05-Anchorage School District,
Spring Hill Elementary School Roof Replacement
9911 Lake Otis Parkway, Anchorage, Alaska 99507

Appendix B.2

SciApps X-550, Serial No. 00528

RESULTS OF XRF TESTING

HTRW, LLC, Christopher T. Ottosen
 September 16, 2022

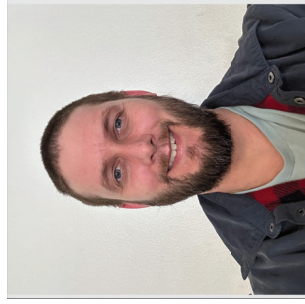
READING NUMBER	FLOOR	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	Lead (Pb) mg/cm ²	+/- ERROR
89	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	1.008	0.032

- Calibration Check: The SciApps X-550 XRF instrument calibration is validated using the National Institute of Standards and Technology, Standard Reference Material 2573 (NIST SRM 2573), Lead Paint Film for Building Surfaces, which is red in color with a certified lead concentration of 1.040 +/- 0.064 mg/cm². The instrument's calibration check limits are from 0.8 to 1.2 mg/cm² (inclusive) when using the NIST SRM 2573 in accordance with the Performance Characteristic Sheet (PCS).

Appendix B.2 – Lead Inspector Certifications

United States Environmental Protection Agency

This is to certify that



Christopher T Ottosen

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Risk Assessor



In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires September 29, 2027

LBP-R-1157245-3

Certification #

February 27, 2024

Issued On



Adrienne Priselac, Manager, Toxics Office

Land Division



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

February 04, 2022

Christopher Ottosen
HTRW, LLC
11471 Business Blvd
Eagle River, AK 99577

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

Dear Christopher Ottosen:

Thank you for applying to the U.S. Environmental Protection Agency (EPA) for certification to conduct Lead-based Paint Activities in target housing and child-occupied facilities. I am pleased to inform you that, pursuant to 40 CFR Part 745, Subpart L, your lead-based paint activities firm is certified. Your certificate is enclosed.

This certification **expires on February 15, 2025 and is valid in All EPA Administered States, Tribes, and Territories**. However, if a State in which you are certified obtains program authorization during the term of this certification, the scope of your certification will be diminished to exclude the affected area.

Your EPA firm certification is subject to the following restrictions:

- 1) Individual states and Indian tribes, whether authorized or not, are not required to accept EPA certification and may accept or reject it under its own authority. Please be aware that your EPA certification does not relieve you of any obligations you may have to any State or Indian tribe regarding lead-based paint activities.
- 2) EPA certification is specific and limited as described above. If you wish to obtain certification in other lead-based paint disciplines, you must apply separately.
- 3) In advertising the EPA certification, firms must indicate clearly that the firm is certified only for purposes of Section 402 of TSCA. Failure to accurately state EPA certification conditions could result in EPA suspending or withdrawing certification.
- 4) EPA may conduct audits and/or inspections to ensure continued compliance with regulatory standards, and may revoke or suspend its certification if subsequent alterations or deviations result with the firm no longer meeting the standards found at 40 CFR Part 745, Subpart L.

If you have questions about the lead-based paint activities rule or need assistance, please contact the Regional Lead Coordinator, Kim Farnham, of the EPA Region 10 staff at 206-553-6697. If you have any questions about your firm certification, please contact the National Lead Information Center at 1-800-424-LEAD and refer to **Application ID number A786633**. Congratulations, and thank you for your interest in being a certified abatement firm.

Sincerely,

A handwritten signature in black ink that reads "Michelle Price".

Michelle Price, Chief
Lead, Heavy Metals, and Inorganics Branch

Enclosures

United States Environmental Protection Agency

This is to certify that



HTRW, LLC

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires February 15, 2025

LBP-F232766-1

Certification #

February 01, 2022

Issued On

Michelle Price, Chief

Lead, Heavy Metals, and Inorganics Branch

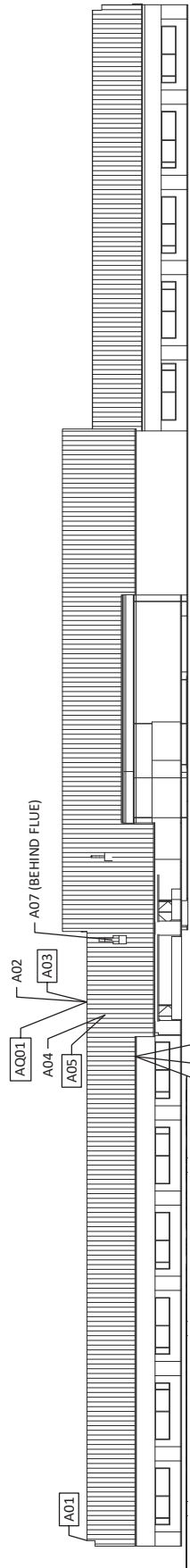


**Appendix C – Other Common Hazardous Building
Material (no sampling of these materials was
performed)**

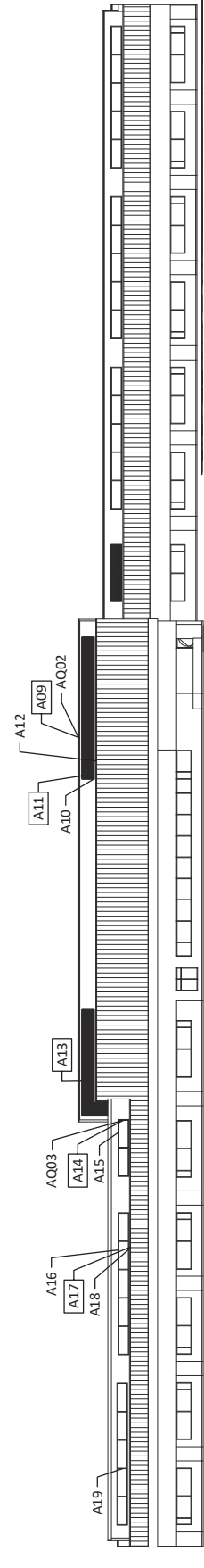
Appendix C.6 – PCB Laboratory Accreditations

Appendix D – Drawings of Asbestos and Lead Test Locations

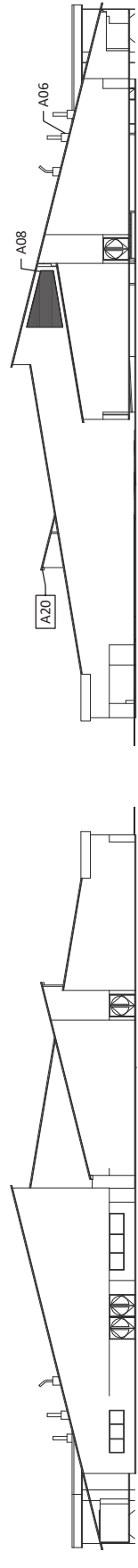
Appendix D – Drawings of Asbestos and Lead Test Locations



1 NORTH ELEVATION
 NTS



2 SOUTH ELEVATION
 NTS

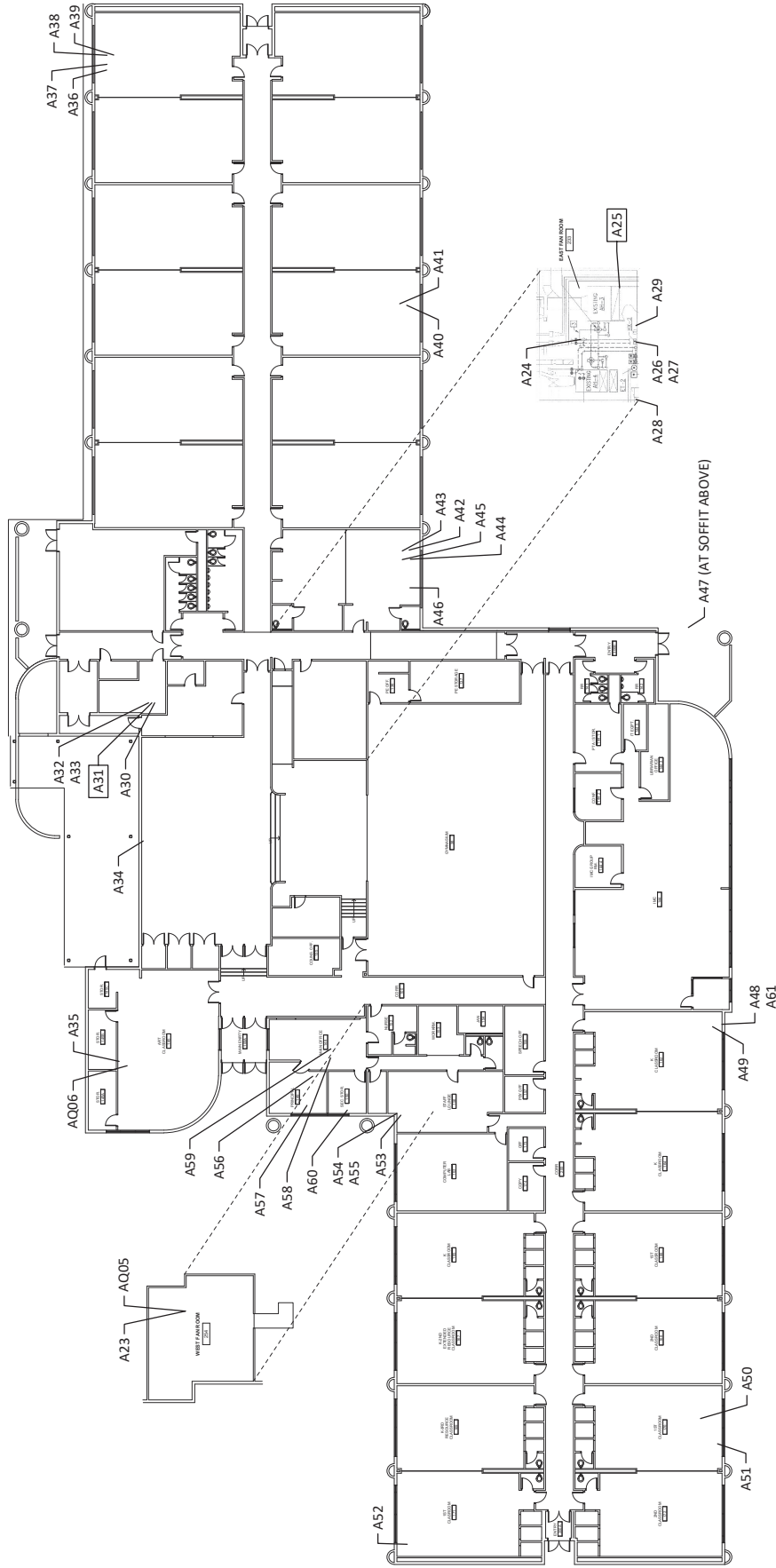


3 WEST ELEVATION
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4 EAST ELEVATION
 NTS

- AXX ASBESTOS SAMPLE LOCATION
- AXX SAMPLE CONTAINING ASBESTOS
- All samples have a prefix of SG0224- unless noted otherwise.
- Refer to the Hazardous Materials Assessment for complete information about these samples.

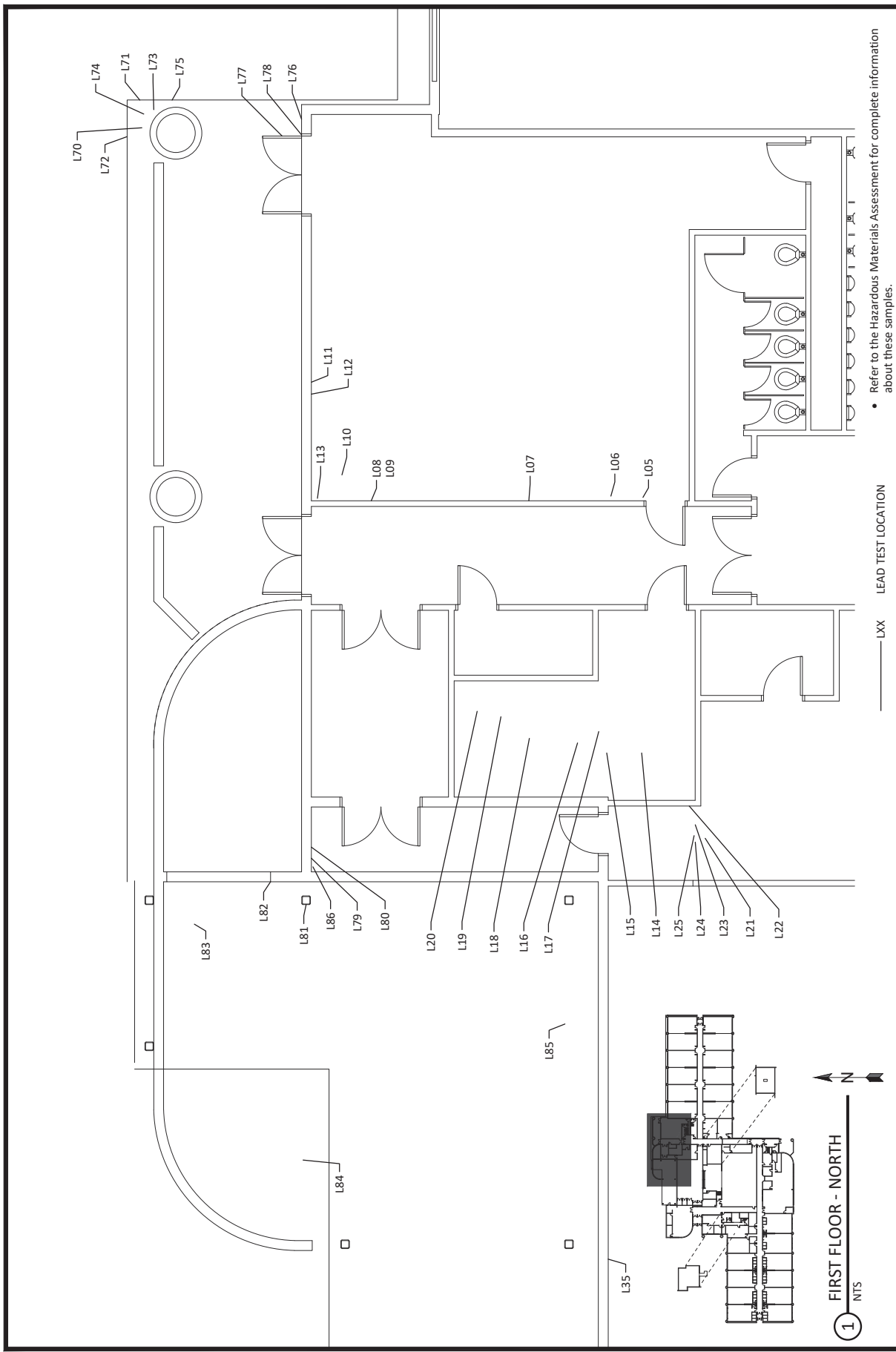
<p>HTRW, LLC HAZARDOUS BUILDING MATERIALS CONSULTING 11471 BUSINESS BLVD., #773442, EAGLE RIVER, AK 99577 (907) 917-3801 • (917) 203-7517 (FAX) • CONTACT@HTRW-LLC.COM</p>		Sheet Title	Asbestos Sample Locations	
		HTRW Project Number	2024-05	
Project Name		Anchorage School District, Spring Hill Elementary School Roof Replacement	Inspector/Collected By	Christopher T. Ottosen
Address/Location		9911 Lake Otis Parkway, Anchorage, Alaska 99507	Collection Date	February 10, 2024
Drawing Number		2024-05-SL.dwg	Sheet Number	SL-1



FIRST FLOOR
 NTS

- AXX ASBESTOS SAMPLE LOCATION
- AXX SAMPLE CONTAINING ASBESTOS
- All samples have a prefix of SG0224- unless noted otherwise.
- Refer to the Hazardous Materials Assessment for complete information about these samples.

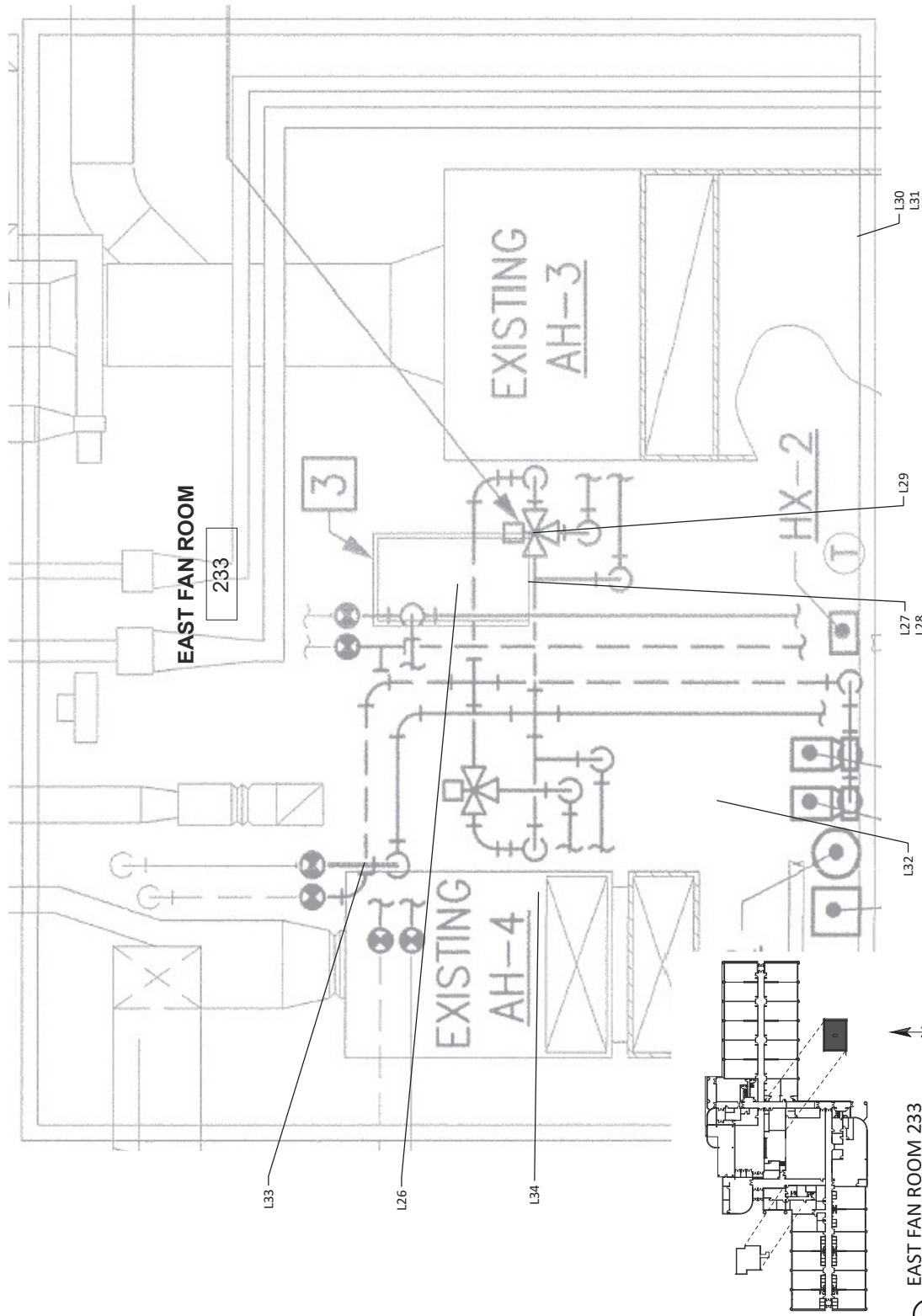
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Sheet Title HTRW Project Number 2024-05	Asbestos Sample Locations 2024-05	Sheet Number SL-2
Project Name Anchorage School District, Spring Hill Elementary School Roof Replacement	Inspector/Collected By Christopher T. Ottosen	Collection Date February 10, 2024
Address/Location 9911 Lake Otis Parkway, Anchorage, Alaska 99507		



Refer to the Hazardous Materials Assessment for complete information about these samples.

Sheet Title HTRW Project Number Project Name Address/Location		Sheet Title 2024-05 Anchorage School District, Spring Hill Elementary School Roof Replacement 9911 Lake Otis Parkway, Anchorage, Alaska 99507	Drawing Number 2024-05-SL.dwg
XRF Reading Locations 2024-05 Anchorage School District, Spring Hill Elementary School Roof Replacement 9911 Lake Otis Parkway, Anchorage, Alaska 99507		Sheet Number SL-3	Inspector/Collected By Christopher T. Ottosen
Collection Date February 28, 2024		Collection Date February 28, 2024	

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Refer to the Hazardous Materials Assessment for complete information about these samples.

LEAD TEST LOCATION LXX

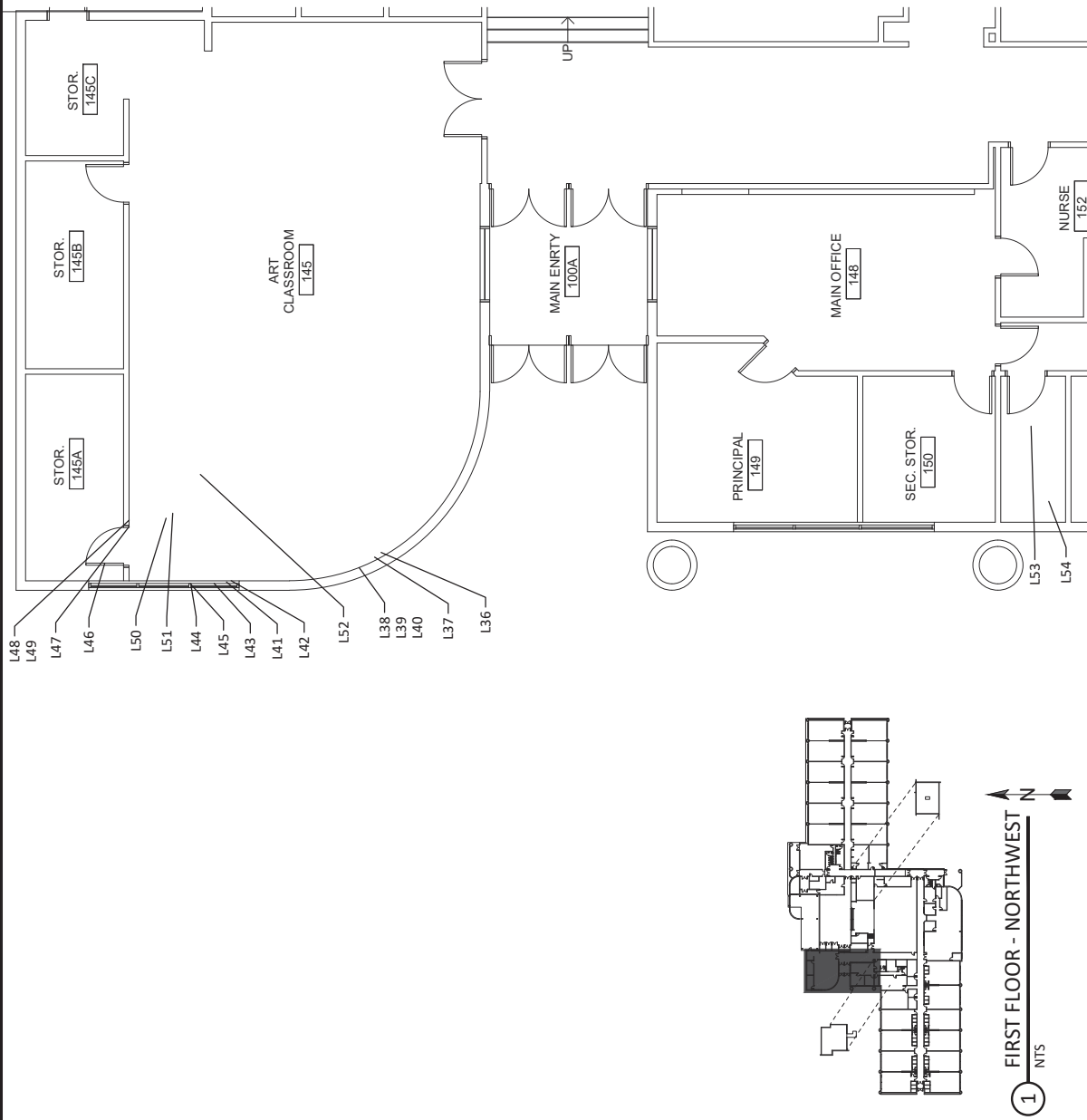
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Sheet Number	SL-4
Inspector/Collected By	Christopher T. Ottosen
Collection Date	February 28, 2024

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Project Name	Anchorage School District, Spring Hill Elementary School Roof Replacement
Address/Location	9911 Lake Otis Parkway, Anchorage, Alaska 99507




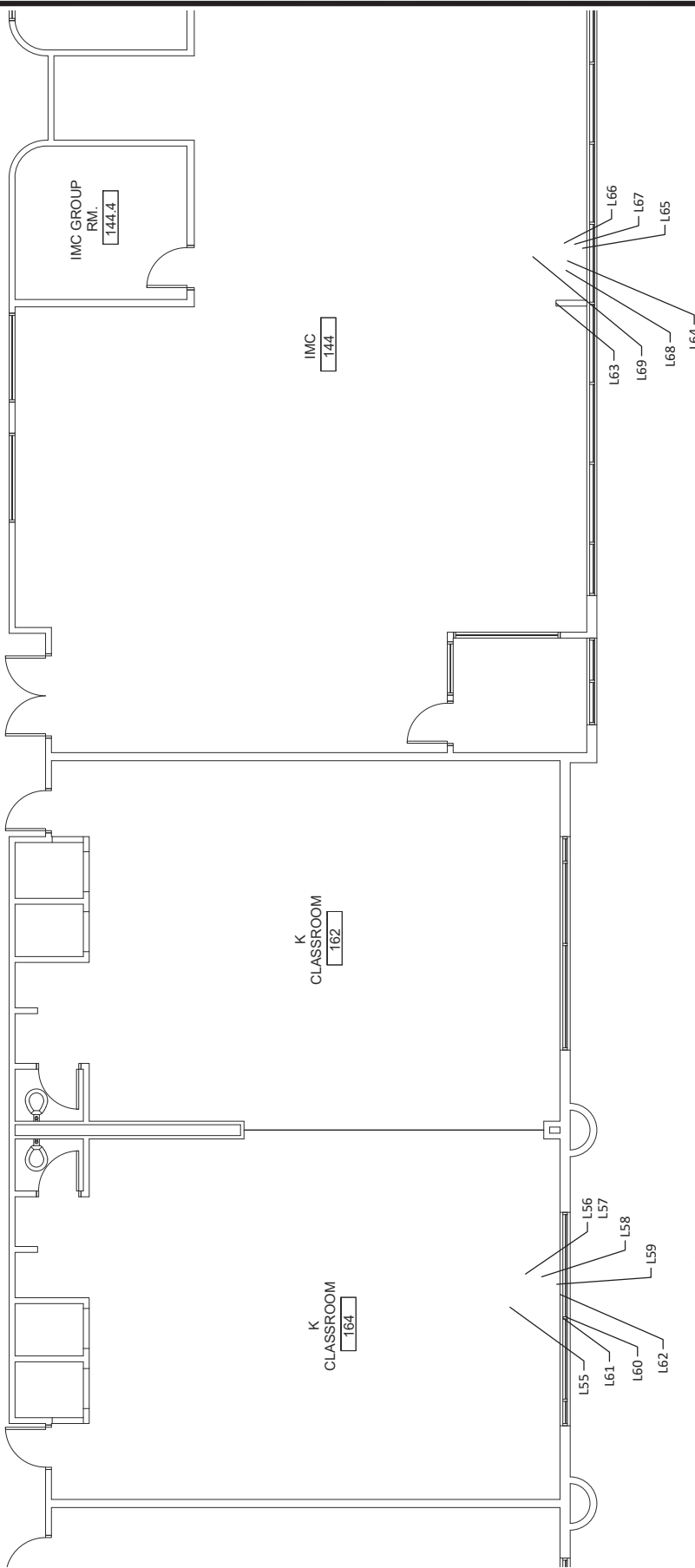
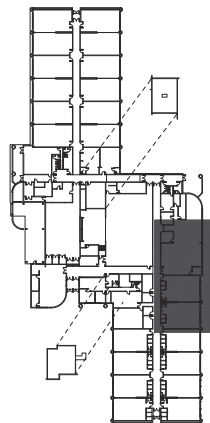
HTRW, LLC

HAZARDOUS BUILDING MATERIALS CONSULTING
 11471 BUSINESS BLVD., #773442, EAGLE RIVER, AK 99577
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LEAD TEST LOCATION
 LXX
 Refer to the Hazardous Materials Assessment for complete information about these samples.

 <p>HTRW, LLC HAZARDOUS BUILDING MATERIALS CONSULTING 11471 BUSINESS BLVD., #773442, EAGLE RIVER, AK 99577 (907) 917-3801 • (917) 203-7517 (FAX) • CONTACT@HTRW-LLC.COM</p>		XRF Reading Locations 2024-05 Anchorage School District, Spring Hill Elementary School Roof Replacement 9911 Lake Otis Parkway, Anchorage, Alaska 99507	Drawing Number 2024-05-SL.dwg
HTRW Project Number	Sheet Title	Drawing Number	Sheet Number
Project Name	Project Name	Inspector/Collected By	Inspector/Collected By
Address/Location	Address/Location	Collection Date	Collection Date



1 NTS
 FIRST FLOOR - SOUTH

_____ LXX LEAD TEST LOCATION
 • Refer to the Hazardous Materials Assessment for complete information about these samples.

<p>HTRW, LLC HAZARDOUS BUILDING MATERIALS CONSULTING 11471 BUSINESS BLVD., #773442, EAGLE RIVER, AK 99577 (907) 917-3801 • (917) 203-7517 (FAX) • CONTACT@HTRW-LLC.COM</p>	Sheet Title HTRW Project Number Project Name Address/Location	XRF Reading Locations 2024-05 Anchorage School District, Spring Hill Elementary School Roof Replacement 9911 Lake Otis Parkway, Anchorage, Alaska 99507	Drawing Number Sheet Number Inspector/Collected By Collection Date	2024-05-SL.dwg SL-6 Christopher T. Ottosen February 28, 2024
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Appendix E – Supplemental Information



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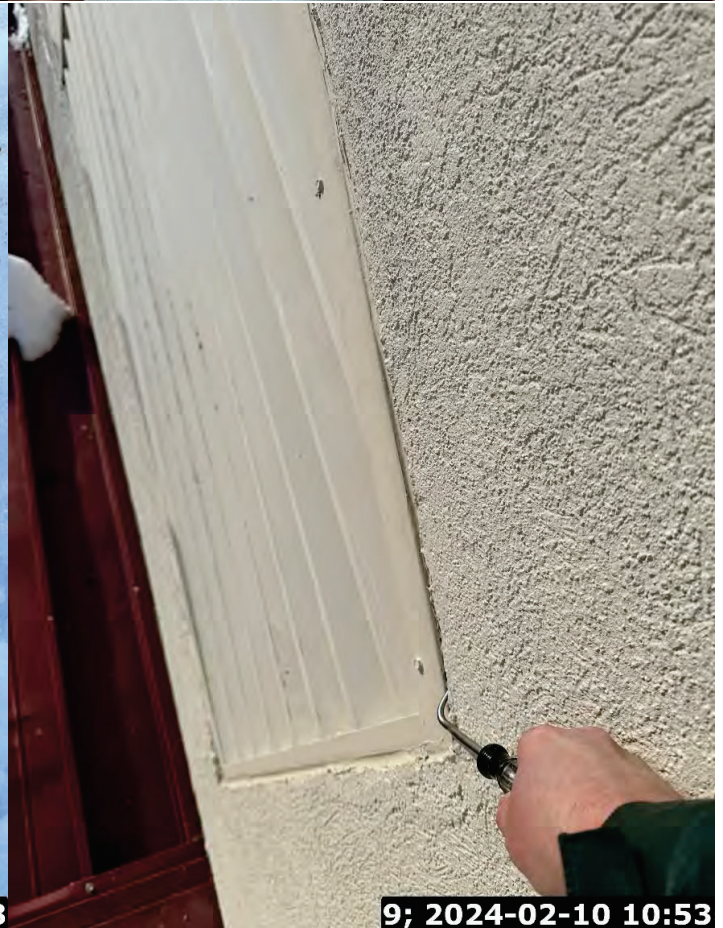
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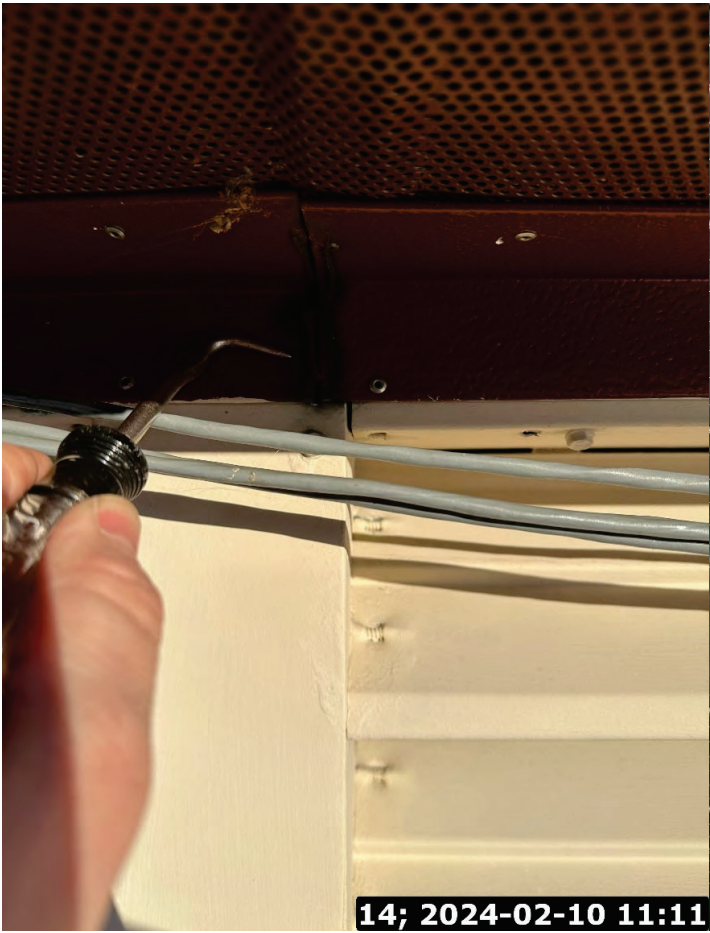
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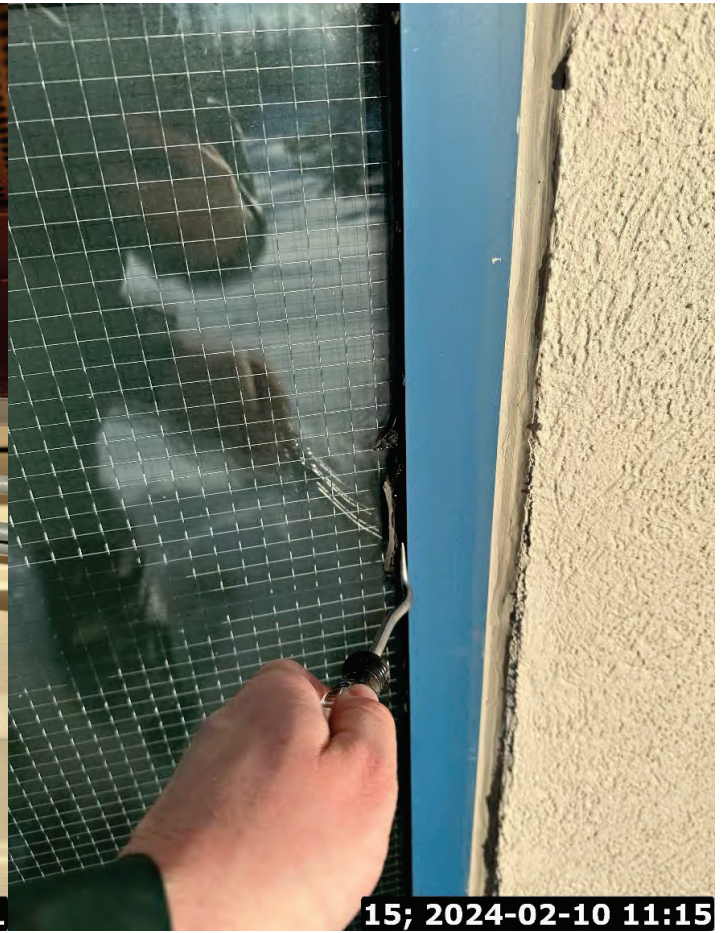
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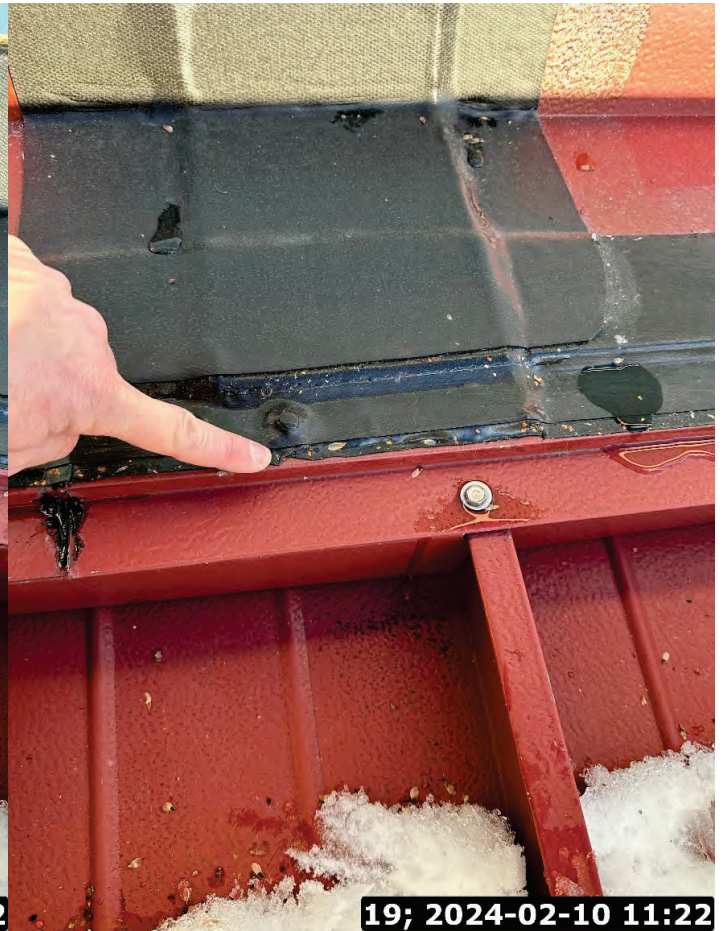
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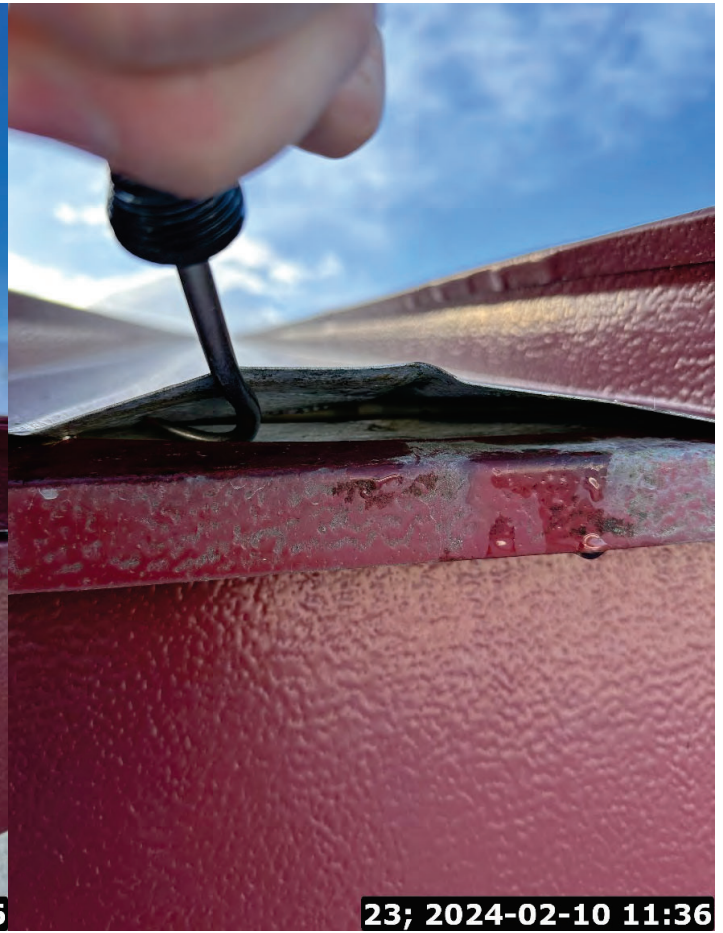
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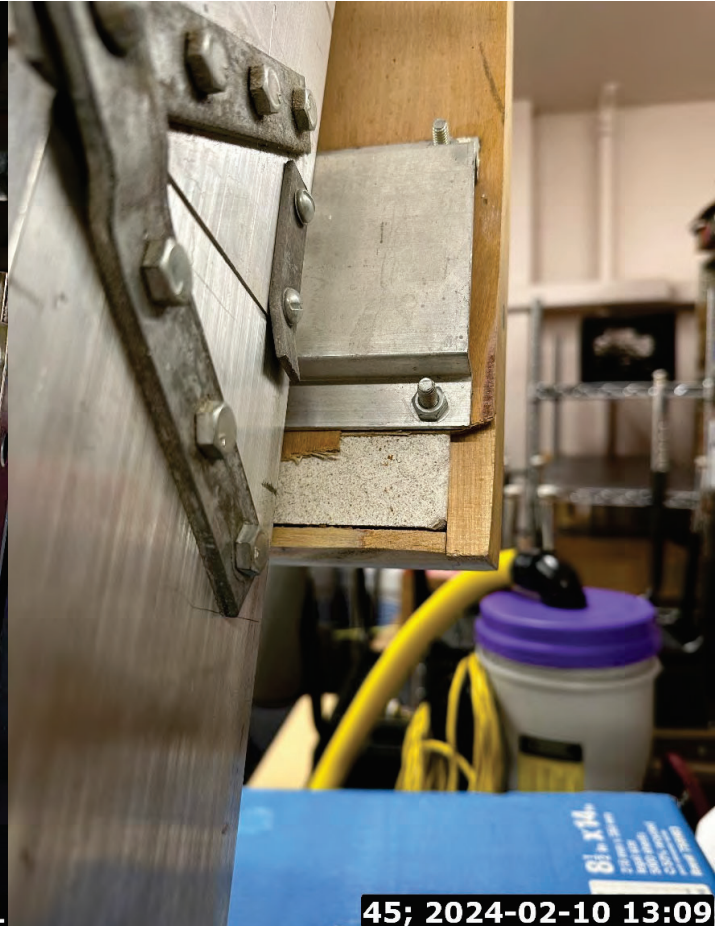
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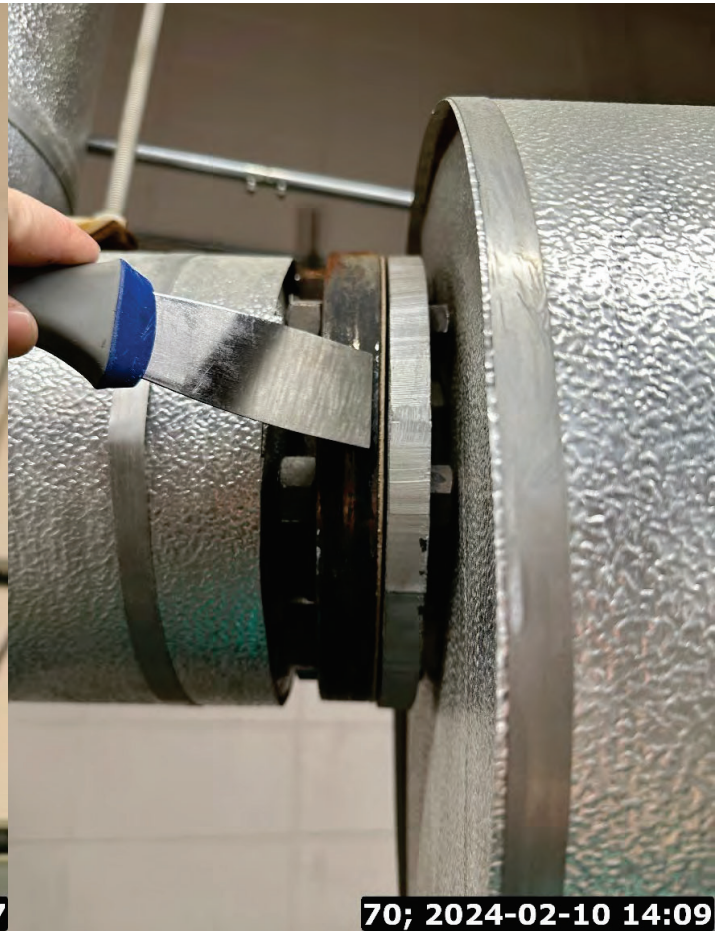
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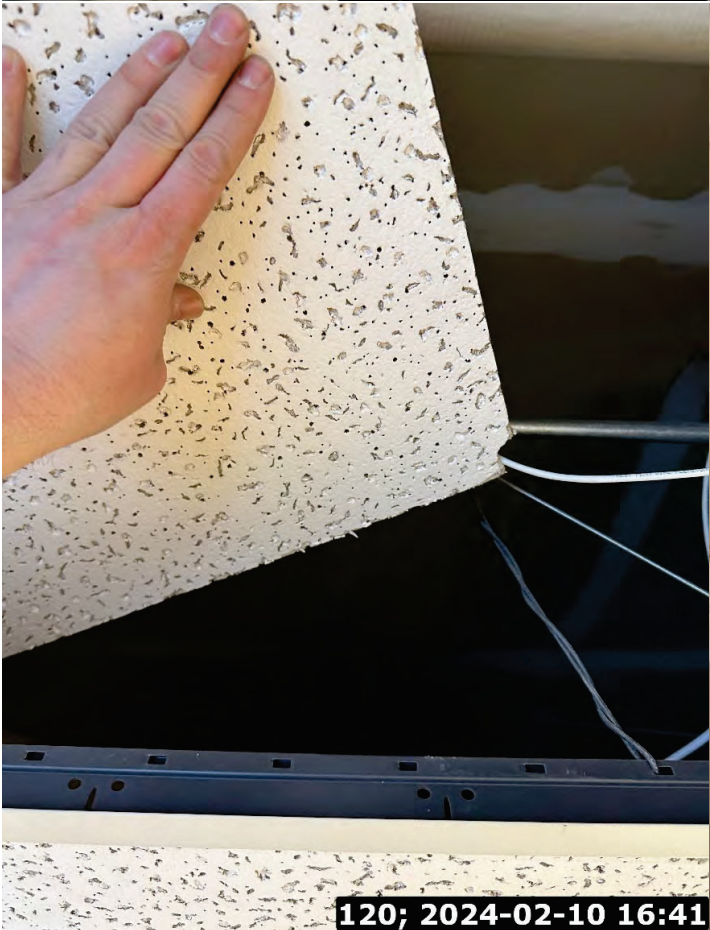
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SELECTIVE BUILDING DEMOLITION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 02 26 00 – Hazardous Materials Assessment
- B. Section 02 82 33 – Removal and Disposal of Asbestos Containing Materials
- C. Section 02 88 00 - Removal and Disposal of Miscellaneous Materials

1.2 DEFINITION

- A. Demolition - Demolish: Completely detach from existing construction, tear down, remove and legally dispose of off-site.
- B. Salvage: Remove without damage for reuse.

1.3 APPLICABLE PUBLICATIONS

- A. International Building Code (IBC) Section 3302 – Construction Safeguards: Exit Maintenance and Fire Safety.

1.4 SUBMITTALS

- A. Record of contractor demolition experience.
- B. Description of demolition and removal procedures including dust and noise control.
- C. Schedule: Submit schedule indicating proposed methods and sequence of operations for demolition work to the OWNER for review before commencement of work. Include coordination for shut-off, capping, and continuation of utility services as required, together with details for dust and noise control protection.
 - 1. Provide a detailed sequence of demolition and removal work to ensure uninterrupted progress of the OWNER'S on-site operations.
 - 2. Coordinate with the OWNER'S continuing occupation of portions of the existing building.
- D. Shoring and handrail guardrail design drawings and calculations sealed by a Registered Engineer where handrails are adjacent to public access.
- E. Maintain and submit record drawings of underground active utilities to remain.
- F. Submit photos of existing surrounding conditions before demolition.

1.5 QUALITY ASSURANCE

- A. Demolition firm qualifications: Company with at least five (5) successful completed demolition work projects like this project.
- B. Regulatory requirements: Comply with governing authorities before starting demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.6 PRE-DEMOLITION MEETING

- A. Meet with the OWNER representative to review the proposed schedule and sequence of work before the start of work.

1.7 EXISTING CONDITIONS

- A. Conduct demolition to minimize interference with adjacent buildings and property areas. Always maintain protected egress and access.
- B. Provide, erect, and maintain temporary barriers and security devices.
- C. Notify OWNER and AUTHORITIES owning or controlling affected services before starting operations and disconnecting services.
- D. Differing Conditions: Should materials, systems, or conditions be encountered that differ from those indicated, immediately notify OWNER, and do not proceed without approval.
- E. If Contractor encounters hazardous materials, or suspected hazardous materials notify OWNER immediately and do not disturb.
- F. Hazardous Materials are anticipated. Refer to OWNER's separate report and follow approved removal and disposal procedures.

1.8 CONDITION OF STRUCTURES

- A. The OWNER assumes no responsibility for the actual condition of items or structures to be demolished.
- B. A copy of existing construction drawings is available for review at the OWNER'S offices. The accuracy and completeness of these construction drawings are not guaranteed.

1.9 OWNER OCCUPANCY

- A. The OWNER will be continuously occupying areas of the building immediately adjacent to areas of demolition. Conduct demolition work in a manner that will minimize the need for disruption of the OWNER'S normal operations.
- B. Provide a minimum of 72 hours advance notice to the OWNER of demolition activities, which will cause severe impact.

1.10 SALVAGE

- A. Items indicated to be demolished or removed but of salvable value to the Contractor may be removed from the structure as work progresses. Transport salvaged items from the site as they are removed.
- B. Storage or sale of removed items on site will not be permitted.
- C. Items indicated to be salvaged for OWNER'S reuse remain the OWNER'S property.

1.11 DAMAGES

- A. Promptly repair damages caused to adjacent facilities by demolition work at no cost to the OWNER.

1.12 TRAFFIC

- A. Conduct demolition operations and debris removal in a manner to ensure minimum interference with streets, walks, and other adjacent facilities.
- B. Do not close, block, or otherwise obstruct streets, walks or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

1.13 ENVIRONMENTAL CONTROLS

- A. Use temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations about environmental protection.

PART 2 - PRODUCTS

2.1 BARRIER PARTITIONS

- A. Provide a barrier between demolition and occupied building areas.
- B. Fabricate barriers from two layers of 6-mil thread reinforced plastic sheet, with lapped, stapled, and taped seams, or other approved low permeability material.
- C. Framing for barriers may be of wood or metal free from rough or sharp projections and edges, with sufficient strength to maintain the integrity of the dust-controlling membrane.

2.2 PROTECTIVE RAILINGS

- A. Fabricate handrails-guardrails from wood, steel, or other approved materials and anchor solidly to the structure.
- B. Railings shall withstand a 200-pound load applied in any direction at any point on the rail.
- C. Railings shall withstand a load of 50 pounds per lineal foot applied horizontally at right angles to the top rail.

2.3 PROTECTION

- A. Protect from demolition and exterior weather as necessary to prevent damage to existing finishes and equipment to remain.
- B. Provide temporary shoring or supports as necessary to prevent any damage to the adjacent building and paving to remain while demolishing and maintain until permanent structure is in place.

- C. Protect to allow safe passage of OWNER's personnel to occupied portions of the existing building.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Before commencement of demolition work, inspect areas in which work will be performed. Photograph existing conditions at adjacent structure surfaces, equipment, or surrounding properties, which could be damaged resulting from demolition work.
 - 1. Provide a minimum of 4 by 5-inch digital images showing a complete record of existing building interior and exterior demolition areas and adjacent properties.
 - 2. Submit to OWNER before starting work.

3.2 PREPARATION

- A. Erect and maintain temporary barrier partitions to prevent the spread of dust, fumes, noise, and smoke. Provide temporary barricades and other forms of protection as required to protect the OWNER'S personnel and the general public from injury due to demolition work.
 - 1. Provide protective measures as required to provide free and safe passage of the OWNER'S personnel and the general public to and from occupied portions of the building.
 - 2. Protect from damage to existing finish work that is to remain in place and that becomes exposed during demolition operations.
 - 3. Provide temporary weather protection to ensure that no water leakage or freeze damage occurs to the structure or interior areas of the existing building.
 - 4. Remove protections at completion of work.
- B. Protect existing items and site paving that are not indicated to be altered with plywood, tarps, and similar shielding.
- C. Remove and store in protected area items noted to be removed and reinstalled or salvaged.
- D. Mark locations, disconnect, remove, and cap designated utility services within demolition areas. Maintain and protect existing utilities indicated to remain. Provide 72-hour advance notice to OWNER if a shutdown is necessary.
- E. Mark the location of disconnected utilities. Identify and indicate capping locations on Project Record Documents.

3.3 DEMOLITION

- A. Demolish and remove building items indicated including foundations below ground. Fill in below-grade areas and voids using existing soils to avoid steep banks, ponded water and slope to natural soil angles of repose.
- B. Except where noted otherwise, immediately remove demolished materials from site as work progresses.

SELECTIVE BUILDING DEMOLITION

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- C. Erect and maintain temporary partitions and closures to separate areas where noisy or dusty demolition operations are performed to prevent the spread of excessive noise, dust, or fumes to occupied portions of the building and to protect the interior of the building from weather.
 - 1. Construct temporary barrier partitions of minimum 3-1/2-inch steel studs, 5/8-inch Gypsum board painted white on occupied side, 5/8-inch gypsum exterior sheathing on demolition or weather side, and fill stud cavities with fiberglass insulation.
- D. Perform demolition work in a systematic orderly manner. Use such methods as required to complete work indicated on drawings under the approved demolition schedule and governing regulations.
 - 1. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.
 - 2. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.
 - 3. For slabs on grade, use removal methods that will not crack or structurally disturb adjacent slabs or walls. Use a power saw where possible.
 - 4. Unbolt structural steel members where possible.
- E. Where demolition methods include flame cutting or grinding, provide separate personnel for fire watch during and for four hours after flame cutting and grinding with appropriate hand-held fire extinguishers.
- F. If unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate and measure both the nature and extent of the conflict. Submit a report to the OWNER in written, accurate detail. Pending receipt of directive from the OWNER rearrange selective demolition schedule as necessary to continue overall job progress without delay.
- G. Do not use explosives.
- H. Do not burn or bury materials on site.

3.4 SALVAGE ITEMS TO OWNER

- A. Remove the following material and equipment, intact with mounting hardware and connections, for use by OWNER:
 - 1. Shelving not reused in the Work.
 - 2. Doors, frames, and hardware not reused in the Work.
 - 3. Electrical devices (lights, power poles, etc.) not reused in the Work.
 - 4. Mechanical equipment (diffusers, mixing boxes, etc.) not reused in the Work.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove debris, rubbish, and other materials resulting from demolition operations from the building site. Transport and legally dispose of materials off-site as work progresses.
 - 1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution. Remove asbestos containing building materials as specified in separate Specification Section.

3.6 CLEAN-UP AND REPAIR

- A. Upon completion of demolition work, remove tools, equipment, and demolished materials from the site. Remove protections.
- B. Leave interior areas to remain broom-clean and free of demolition dust.
- C. Leave exterior site area free from demolished building remains.
- D. Repair demolition performed more than that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION

REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS

PART 1 – GENERAL

1.1. NOTIFICATIONS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.2. SECTION INCLUDES

- A. This section applies to work involving the removal, disturbance, transportation, and disposal of materials with asbestos.
- B. This section does not apply to or address requirements related to any other health, safety, or environmental concerns related to other types of materials or conditions which may be present at this site.

1.3. CONTRACT DOCUMENTS AND RELATED REQUIREMENTS

- A. Drawings and general provisions of the contract, including general and supplementary conditions and other Division 0, 1, and 2 specifications, apply to the work of this section. The contract documents show or describe the work to be done under the contract including related requirements and conditions impacting the project. Related requirements and conditions include, but are not limited to, applicable codes and regulations, notices and permits, existing site conditions and restrictions on use of the site, security of the site, requirements for partial owner occupancy during the work, coordination with other work and the phasing of the work, among others. In the event the Contractor discovers a conflict in the contract documents and/or requirements, the conflict must be brought to the immediate attention of the Owner for resolution. Whenever there is a conflict or overlap in the requirements, the most stringent shall apply. Any actions taken by the Contractor without authorization from the Owner shall become the sole risk and responsibility of the Contractor. All costs incurred due to such action are also the responsibility of the Contractor.

1.4. RELATED WORK

- A. 02 26 00 – Hazardous Materials Assessment
- B. 02 88 00 – Removal and Disposal of Miscellaneous Hazardous Materials

1.5. REFERENCE STANDARDS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS

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- B. All work under this contract shall be done in strict accordance with all applicable federal, state, and local regulations, standards and codes governing asbestos work, and any other trade work done in conjunction with the project. All applicable codes, regulations, and standards are adopted into this specification and will have the same force and effect as this specification.
- C. The most recent edition of any relevant regulation, standard, document, or code shall be in effect. Where conflict among the requirements or with these specifications exists, the most stringent requirement(s) shall be utilized.
- D. All related regulations, statutes, public laws, registers, and regulatory guidance are incorporated by reference.
- E. Alaska Administrative Code (AAC)
 - 1. 8 AAC 61 Occupational Safety and Health Division
 - 2. 8 AAC 61.600-790 Asbestos Abatement Certification
 - 3. 8 AAC 61.1010-1190 Occupational Safety and Health Standards
 - 4. 17 AAC 25 Operations, Wheeled Vehicles
 - 5. 18 AAC 60 Solid Waste Management
 - 6. 18 AAC 60.450 Asbestos Disposal Regulations
 - 7. 18 AAC 62 Hazardous Waste
 - 8. 18 AAC 70 Water Quality Standards
 - 9. 18 AAC 72 Wastewater Treatment and Disposal
 - 10. 18 AAC 75 Oil and Other Hazardous Substances Pollution Control
- F. Alaska Statutes (AS)
 - 1. AS Section 18.31 Asbestos
 - 2. AS Section 18.60 Safety
 - 3. AS Section 18.62 Certificates of Fitness
 - 4. AS Section 23.05 Department of Labor and Workforce Development
- G. American National Standards Institute (ANSI)
 - 1. ANSI Z535 Series Safety Alerting Standards
- H. American Society of Safety Professionals (ASSP)
 - 1. ASSP Z9.2 Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems
- I. ASTM International (ASTM)
 - 1. ASTM C732 Aging Effects of Artificial Weathering on Latex Sealants
 - 2. ASTM D522/D522M Mandrel Bend Test of Attached Organic Coatings
 - 3. ASTM D2794 Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
 - 4. ASTM D4397 Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
 - 5. ASTM D4801 Standard Specification for Polyethylene Sheeting in Thickness of 0.25 mm (0.010 in.) and Greater
 - 6. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
 - 7. ASTM E96/E96M Standard Test Methods for Water Vapor Transmission of Materials
 - 8. ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials
 - 9. ASTM E736/E736M Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
 - 10. ASTM E1368 Visual Inspection of Asbestos Abatement Projects

REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS

Division 2
Section 02 82 33

11. ASTM F2412 Standard Test Methods for Foot Protection
 12. ASTM F2413 Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear
- J. Compressed Gas Association (CGA)
1. CGA G-7 Compressed Air for Human Respiration; 6th Edition
- K. Institute of Environmental Sciences and Technology (IEST)
1. IEST-Recommended Practices-Contaminant Control (IEST-RP-CC-xxxx) Series
- L. International Air Transport Association (IATA)
1. IATA DGR Dangerous Goods Regulations
- M. International Organization for Standardization (ISO)
1. ISO 13.340 Protective Equipment Series Standards
- N. International Safety Equipment Association (ISEA)
1. ANSI/ISEA 101 Limited-Use and Disposable Coveralls—Size and Labeling Requirements
 2. ANSI/ISEA 105 Hand Protection Classification
 3. ANSI/ISEA Z87.1 Occupational and Educational Personal Eye and Face Protection Devices
 4. ANSI/ISEA Z88 Series Respiratory Protection Standards
- O. National Fire Protection Association (NFPA)
1. NFPA 701 Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
 2. NFPA 1990 Standard for Protective Ensembles for Hazardous Materials and CBRN Operations
- P. National Institute for Occupational Safety and Health (NIOSH)
1. NIOSH NMAM NIOSH Manual of Analytical Methods
- Q. Underwriters Laboratories (UL)
1. UL 586 Standard for Safety High-Efficiency Particulate, Air Filter Units
- R. United States Army Corps of Engineers (USACE)
1. Engineer Manual EM 385-1-1 Safety and Health Requirements
- S. United States Department of Transportation
1. 49 CFR 107 Hazardous Materials Program Procedures
 2. 49 CFR 171 General Information, Regulations, and Definitions
 3. 49 CFR 172 Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
 4. 49 CFR 173 Shippers - General Requirements for Shipments and Packagings
- T. United States Environmental Protection Agency (EPA)
1. EPA 340/1-90/018 Asbestos/NESHAP Regulated Asbestos Containing Materials Guidance
 2. 40 CFR 61-Subpart A General Provisions
 3. 40 CFR 61-Subpart M National Emission Standard for Asbestos
 4. 40 CFR 763 Asbestos

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- U. United States Military Standards
 - 1. MIL-STD-282 Filter Units, Protective Clothing, Gas-Mask Components and Related Products: Performance Test Methods

- V. United States Occupational Safety and Health Administration (OSHA)
 - 1. 29 CFR 1910.120 Appendix B General Description and Discussion of the Levels of Protection and Protective Gear.
 - 2. 29 CFR 1910 Subpart I Appendix A Nonmandatory Compliance Guidelines for Hazard Assessment and Personal Protective Equipment Selection
 - 3. 29 CFR 1910.134 Respiratory Protection
 - 4. 29 CFR 1926 Safety and Health Regulations for Construction
 - 5. 29 CFR 1926.21 Safety Training and Education
 - 6. 29 CFR 1926.28 Personal Protective Equipment
 - 7. 29 CFR 1926.32 Definitions
 - 8. 29 CFR 1926.51 Sanitation
 - 9. 29 CFR 1926.55 Gases, Vapors, Fumes, Dusts, and Mists
 - 10. 29 CFR 1926.59 Hazard Communication
 - 11. 29 CFR 1926 Subpart E (Parts 95-107) Personal Protective and Life Saving Equipment
 - 12. 29 CFR 1926.95 Criteria for Personal Protective Equipment
 - 13. 29 CFR 1926.103 Respiratory Protection
 - 14. 29 CFR 1926.200 Accident Prevention Signs and Tags
 - 15. 29 CFR 1926.1101 Asbestos
 - 16. OSHA Publication 3071 Job Hazard Analysis

1.6. DEFINITIONS

- A. Definitions used in this section include those used in Divisions 00, 01, and 02; those defined by the Reference Standards listed above; and the following:

- B. Asbestos Abatement Contractor (AAC)
 - 1. The Asbestos Abatement Contractor (AAC) means the specialty contractor or subcontractor hired by the General Contractor, the Owner, or other authorized entity to perform the work covered by this section.

- C. Auxiliary Work
 - 1. Auxiliary Work is intended to include all work that is not defined as a Major Element by this section. An example of Auxiliary Work includes work such as routing of new mechanical or electrical systems within the Main Work Areas and to areas outside of the Main Work Area(s).

- D. Contractor's Professional Industrial Hygienist (CPIH)
 - 1. The Contractor's Professional Industrial Hygienist (CPIH) is responsible for all monitoring, inspections, sampling, and testing which is not work required to be performed by the IIHT. The CPIH may be hired directly by the AAC.

- E. General Contractor (GC)
 - 1. General Contractor (GC) means the entity the Owner has entered into agreement with to serve as the overall authority of the construction-related aspects of the contract.

- F. Hazardous Materials Assessment (HMA)
 - 1. Hazardous Materials Assessment (HMA) means any reports or other existing information related to asbestos-containing materials or other potentially hazardous materials present at the site which is provided prior to the award of the contract.

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- G. Main Work Area
 - 1. Main Work Area is intended to include area(s) which have defined boundaries where the majority of work is located.
- H. Major Element
 - 1. Major Element is intended to include the elements of work which are located within the Main Work Area(s), whose scope is not subject to variations in means or methods, and can generally be identified solely by graphical representation or notation on the contract drawings.
- I. Independent Industrial Hygiene Technician (IIHT)
 - 1. The Independent Industrial Hygiene Technician (IIHT) is responsible for conducting all Final Visual Inspections and Clearance Air Monitoring required by this section. The IIHT and IIHT's employer must be completely independent of the AAC and must have no employee or employer relationship which could constitute a conflict of interest.

1.7. QUALITY ASSURANCE

- A. General
 - 1. Administrative and supervisory personnel shall, at a minimum, consist of the AAC, AAC's approved Competent Person, the accredited Project Designer, the CPIH, and the IIHT. These employees are the GC's representatives responsible for compliance with this section. Non-supervisory personnel must consist of an adequate number of qualified personnel to meet the performance requirements of the project. All personnel must meet required qualifications.
 - 2. Comply with the specific requirements of this contract, 29 CFR 1926.1101, 40 CFR 763, 40 CFR 61 Subpart M, 8 AAC 61.600-790, and other applicable laws, ordinances, rules, and regulations of federal, state, and local authorities having jurisdiction regarding removing, handling, storing, transporting, and disposal of asbestos-containing materials. Notify the Owner and request resolution of conflicts between regulations and specified requirements before starting work.
- B. Responsibilities
 - 1. Owner Responsibilities Prior to Commencement of Work
 - a. The Owner will notify occupants adjacent to regulated areas of project dates and requirements for relocation, if needed. Arrangements must be made prior to starting work for relocation of desks, files, equipment, and personal possessions to avoid unauthorized access into the regulated area. The Owner will coordinate utilities use, locations, and other conditions of use with the GC.
 - 2. Asbestos Abatement Subcontractor Responsibility
 - a. The AAC shall assume primary responsibility and liability for compliance with all applicable federal, state, and local regulations related to all aspects of the asbestos abatement work. The GC shall assume secondary responsibility and liability for their own and their other sub-contractor's compliance with all applicable federal, state, and local regulations as it relates to potential asbestos disturbance. The AAC and GC are responsible for providing and maintaining required documentation including, but not limited to, training, accreditations, medical exams, medical records, personal protective equipment (PPE), respiratory protection, and respirator fit testing, as required by applicable federal, state, and local regulations and this section. The AAC and GC must hold the Owner harmless for any Contractor failure to comply with any applicable work, packaging, transporting, disposal, safety, health, or environmental regulations or contract requirements on the part of themselves, their employees, or their subcontractors.

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C. Site Conditions

1. The condition of the asbestos-containing materials at the site are described in the HMA, and those conditions were accurate as of the dates of inspection cited in that HMA. Prior to starting work in any area, the AAC and GC must verify the accuracy of the conditions that are presented in the HMA, the hazards abatement design drawings and specifications, and the AAC's approved Asbestos Hazard Abatement Plan (AHAP).
2. The building may be occupied and in use during the work. The AAC and GC must coordinate the timing of work with the Owner and other trades to ensure there are no adverse effects to building functions or occupants, and that other performance requirements of the contract are met.

D. Security

1. The AAC and GC are jointly responsible for and must control access to the regulated work areas and areas where asbestos wastes are stored for the duration of the project.
2. Access to the regulated work areas and areas where asbestos wastes are being stored must be restricted to properly trained and protected persons authorized to be in those areas. Entry into these areas by unauthorized persons must be reported immediately to the Competent Person by anyone observing the entry. The Competent Person must immediately require any unauthorized person to leave the regulated area and then notify the Owner and the GC.

E. Variations in Quantity

1. The estimated quantities of asbestos-containing materials to be removed and/or disturbed are shown on the hazards abatement drawings. Nothing in this section may be interpreted as limiting the extent of work otherwise required by this contract and related documents. Refer to the HMA for detailed information on the asbestos-containing materials known or assumed to be present at this site.
2. The estimated quantities are to be considered a baseline for bidding purposes only and are based on limited assessments of materials located within the project work areas which were made accessible to the State-accredited Building Inspector along with additional information made available to the State-accredited Project Designer for use in preparing the hazards abatement drawings and specifications. The AAC and GC must satisfy themselves of the actual quantities to be removed and disposed of and to conduct that work in accordance with applicable laws of the authorities having jurisdiction. The AAC and GC must document the locations and quantities of asbestos-containing materials removed each day from each work area. Quantities of asbestos-containing materials must match the units used on the hazards abatement drawings. Where, in the opinion of the AAC or GC, the use of alternative units is necessary, those alternative units may be used with preapproval from the Owner. Minor variations (+/- 10 percent) in the quantities of asbestos-containing materials shown on the hazards abatement drawings are considered as having no impact on contract price or the performance requirements of this contract. The AAC and GC must submit unit pricing within their bid for each asbestos-containing material identified on the drawings in case additional quantities of material in excess of the minor variation stated above are required to be removed or disturbed and disposed of in order to accommodate the work. The unit prices submitted by the AAC and GC are to be used as the cost basis for additional work required under the contract.

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- F. Preconstruction Conference
1. After the Preconstruction Submittals have been reviewed and approved, a pre-construction meeting must be held with the following parties in attendance at a minimum: the GC, the AAC and their Competent Person(s), other interested sub-contractors, the CPIH, the IIHT, and the Owner. The goals of the pre-construction meeting are to discuss the planned scope, phasing, and overall coordination and execution of the asbestos abatement work; to verify that the approved Preconstruction Submittals are still valid; to identify any potential issues with the project scope, timing, or planning as it relates to the asbestos abatement scope of work, and to ensure agreement among the parties prior to commencing work. The pre-construction meeting minutes and sign in sheet must be submitted to the Owner within 5 days after the completion of the pre-construction meeting.
- G. Stop Asbestos Removal
1. If the Owner or representative of a regulatory authority having jurisdiction presents a verbal Stop Asbestos Removal Order, the AAC and GC must immediately stop all asbestos removal and maintain HEPA filtered negative pressure air flow in the containment and adequately wet any exposed ACM. If a verbal Stop Asbestos Removal Order is issued, the Owner or a representative of a regulatory authority having jurisdiction will follow-up with a written order to the AAC and GC as soon as it is practicable. The AAC and GC must not resume any asbestos removal activity until authorized to do so in writing by the Owner or a representative of a regulatory authority having jurisdiction. A Stop Asbestos Removal Order may be issued at any time the Owner or a representative of a regulatory authority having jurisdiction determines abatement conditions/activities are not being performed within the requirements of this specification, the AAC's approved Asbestos Hazard Abatement Plan, regulatory requirements, or that an imminent hazard exists to human health or the environment. Work stoppage will continue until conditions have been corrected to the satisfaction of the Owner or the representative of a regulatory authority having jurisdiction. Standby time and costs for corrective actions will be borne by the AAC or GC, including any applicable time or expense incurred by any of the personnel categories stated in the beginning of this paragraph, as a result of the Stop Asbestos Removal Order. The occurrence of any of the following events shall be reported immediately by the AAC's Competent Person to the Owner and GC using the most expeditious means (e.g., verbal or telephonic), followed up with written notification to the Owner as soon as practicable. The AAC and GC must immediately stop asbestos removal/disturbance activities and initiate fiber reduction activities if:
 - a. Airborne PCM analysis results outside of the asbestos regulated work area exceeds 0.01 fibers per cubic centimeter or background whichever is higher.
 - b. Breach or break in regulated area containment barrier(s).
 - c. Pressure within a Negative Pressure Enclosure is not maintained at or below - 0.02 inch WCG.
 - d. Serious injury/death at the site.
 - e. Fire/safety emergency at the site.
 - f. Respiratory protection system failure.
 - g. Power failure or loss or inadequate use of wetting agent.
 - h. Any visible emissions observed outside the regulated area.
 - i. Failure to follow project specification requirements.
- H. Protection of Existing Work to Remain
1. The AAC and GC must not damage or cause contamination to existing finishes or other existing elements or areas scheduled to remain at the site. Where such elements or areas are damaged or contaminated as verified by the Owner using visual inspection and/or sample analysis, the AAC and GC must stop work and restore those elements or areas to their original undamaged and uncontaminated condition at no

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additional cost to the Owner. Once the elements or areas have been restored to the satisfaction of the Owner, the work may proceed.

- I. Monitoring, Inspections, Sampling, and Testing
 - 1. All sampling required by this section must be performed by qualified persons meeting the minimum requirements of this section.
 - 2. The CPIH is responsible for conducting all non-clearance monitoring, inspections, sampling, and testing required by this section.
 - 3. All final visual inspections and clearance air monitoring required by this section must be performed by the IIHT.
 - 4. All costs related to the monitoring, inspections, sampling, and testing required by this section are to be borne by the AAC and/or GC.
 - 5. All costs related to additional monitoring, inspections, sampling, and testing exceeding the minimum requirements of this section, including those costs for any failed final visual inspections or clearance air monitoring, shall come at no additional cost to the Owner.
 - 6. The Owner or the representative of a regulatory authority having jurisdiction may observe any monitoring, inspections, sampling, and testing performed under this contract at any time or location at their discretion.
 - 7. The Owner or the representative of a regulatory authority having jurisdiction may perform additional monitoring, inspections, sampling, and testing at any time or location at their discretion.

- J. Onsite Documentation
 - 1. The AAC and GC must ensure employees have access to complete copies of the contract documents, the submittal items and other elements required by this section, and to all applicable standards, regulations, codes, and other documents. Electronic format is acceptable except where the contract documents, the submittal items and other elements required by this section, or applicable standards, regulations, codes, or other documents specifically require physical copies to be maintained. Access must be made available at the jobsite at no cost to the employee during normal working hours or at all times work covered by this section is being performed.

1.8. REQUIREMENTS

- A. Description of Work
 - 1. The following table lists the known and assumed asbestos-containing materials at this site. The asbestos-containing materials that are located within the Main Work Areas under this contract that are anticipated to be disturbed by the Major Elements of the asbestos work being performed are designated by the Disturbance Code "Y". The asbestos-containing materials that may be located inside of the Main Work Areas and/or outside of the Main Work Areas that may require disturbance as necessary to accommodate the overall scope of work and related Auxiliary Work under this contract are designated by the Disturbance Code "M". All remaining asbestos-containing materials are not anticipated to require disturbance to complete any element of work under this contract are designated by the Disturbance Code "N":

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ASBESTOS		
MATERIAL DESCRIPTION	Disturbance Code	*Confirmed = C *Assumed = A *Not Present = None *No Asbestos Detected = NAD *Contains Less Than One Percent Asbestos (≤1%) *Non-Friable Organically Bound Material Assumed to Contain Greater Than One Percent Asbestos = NOB *Presence of material in the era is unknown = -
Miscellaneous asphaltic roof tars, mastics, and sealants on all roofing types and eras	Y	A
Flange gaskets on piping systems	N	A
Flange gaskets on the generator exhaust and muffler	M	C
Valve packings	N	A
Thin crispy black foundation dampproofing	Y	A
Various colors and patterns of 12" x 12" vinyl floor tile	N	NOB
Black flooring mastic	N	NOB
Sticky sealants used on seams, flashings, trim pieces, etc. throughout the standing seam metal roofing, confirmed in colors of grey and light grey, and at <1% in a dark red sealant	Y	C
Tan sealants used on the seams of HVAC system components	Y	C
Grey sealants used on the seams of HVAC system components	Y	C
Lining of clock-speaker box housings, clock housings, and speaker housings	N	A
Various colors of undercoatings on the bottom of stainless steel sinks and drinking fountains	N	A
Black undercoatings on the bottom of stainless steel drinking fountains	N	A
Grouts, mastics, and mortars for ceramic mosaic floor tiles and wall bases	N	A
Various materials used inside of electrical enclosures	M	A
Insulating materials inside of doors	N	A
Standby generator gaskets, sealants, and insulating materials	N	A
Light grey spongy sealant commonly used with the EPDM-like membranes used at VTR penetrations and below the clerestory and louver "walls"	Y	<1%

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ASBESTOS		
MATERIAL DESCRIPTION	Disturbance Code	*Confirmed = C *Assumed = A *Not Present = None *No Asbestos Detected = NAD *Contains Less Than One Percent Asbestos (≤1%) *Non-Friable Organically Bound Material Assumed to Contain Greater Than One Percent Asbestos = NOB *Presence of material in the era is unknown = -
Hard black gasket and associated black sticky gum-like sealant used between the wire glass clerestory glazing and the metal window casing	Y	<1%
Off-white gum-like putty used at duct flanges of supply air, return air, and outside air systems	M	<1%

2. The work includes all related submittals, monitoring, inspections, sampling, testing, removal, disturbance, transportation, disposal, recordkeeping, documentation, and other elements as specified herein.

1.9. LISTING OF REQUIRED SUBMITTALS

- A. Preconstruction Submittals
 1. Asbestos Hazard Abatement Plan (AHAP).
 2. Employee training documentation.
 3. Competent Person documentation.
 4. Affidavit of Medical Surveillance, Respiratory Protection, and Training Accreditation.
 5. License and insurance for the AAC.
 6. CPIH and IIHT documentation.
 7. Testing laboratory documentation.
 8. Documentation of notifications.
 9. Waste transporter documentation.
 10. Waste disposal site documentation.
 11. Preconstruction meeting minutes and sign in sheet (to be submitted after initial approval of preconstruction submittals but prior to the start of work).
 12. Pre-work activities (to be submitted after initial approval of preconstruction submittals but prior to the start of work).
- B. Periodic Submittals
 1. Sampling results.
 2. Project logs.
 3. Updates to any of the preconstruction submittals.
- C. Closeout Submittals
 1. Waste transport records.
 2. Disposal site receipts.
 3. Updates to any previously submitted submittals.

1.10. DETAILS OF REQUIRED PRECONSTRUCTION SUBMITTALS

- A. Asbestos Hazard Abatement Plan (AHAP)
 1. The Asbestos Hazard Abatement Plan (AHAP) must not be combined with other hazard abatement plans, and must be prepared, signed, and sealed by a State-accredited EPA Project Designer. Provide shop drawings for each affected area and a table of contents for each submittal item, which follows the sequence of

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requirements in the contract. The plan, at a minimum, must include the proposed means, methods, materials, equipment, and other procedures to be used by the AAC which must include, but not be limited to, the following elements:

- a. Procedures for notification of other employers and their employees performing work at the site under this contract, building occupants, and other interested parties or as directed by the Owner.
 - b. A pre-work sampling plan describing the procedures to be used to identify, sample, and quantify any additional asbestos-containing materials found that will require disturbance.
 - c. Procedures used to identify, execute, and document potential pre-cleaning activities.
 - d. A detailed plan of the safety precautions such as lockout, tagout, tryout, fall protection, and confined space entry procedures and equipment and work procedures to be used during the removal, disturbance, or demolition of materials containing asbestos.
 - e. Procedures to ensure the protection of existing work to remain.
 - f. Isolation and protection of existing systems.
 - g. Regulated work area setup for each class of asbestos work to be performed.
 - h. Personal protective equipment for each class of asbestos work to be performed.
 - i. Asbestos removal procedure(s) for each material being removed or disturbed.
 - j. Expendable materials to be used for asbestos work such as encapsulants, surfactants, poly sheeting, etc.
 - k. Decontamination area setup for each type of regulated work area and/or class of asbestos work to be performed.
 - l. Procedures to ensure negative air pressure is maintained within Negative Pressure Enclosures and corrective actions to be taken in the event of equipment failure or other events which may lead to inadequate negative pressure.
 - m. Procedures to be used in the event asbestos-containing materials are spilled, leaked, damaged, or otherwise released in a manner resulting in contamination of existing building components.
 - n. Procedures for supplying, controlling, treating, and discharging water and wastewater.
 - o. Air monitoring for each type of regulated work area and/or class of asbestos work to be performed.
 - p. Waste packaging, storage, loadout, decontamination, manifesting, transport, and disposal procedures.
 - q. Procedures to follow in the event additional quantities of known asbestos-containing materials are encountered after the start of work.
 - r. Procedures to follow in the event materials are encountered after the start of work which have not previously been shown to not contain asbestos.
 - s. Current copies of the Project Designer's accreditation.
2. At a minimum, shop drawings must show the following elements:
- a. The locations and extents of each regulated work area.
 - b. Locations of critical barriers.
 - c. Locations of existing systems within and/or adjacent to the regulated work area boundaries to be isolated during the asbestos abatement activities.
 - d. Location of decontamination area(s).
 - e. Location(s) of negative pressure exhaust routing.
 - f. Location of make-up air entrance(s) into each regulated work area.
 - g. Locations of water supplies and wastewater treatment and discharge area(s).
 - h. Locations of air monitoring equipment.
 - i. Location(s) of first aid materials.
 - j. Location(s) of fire extinguishers.
 - k. Emergency egress routes.
 - l. Waste loadout route(s).

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- m. Location of temporary storage area(s).
 - n. The location of copies of all applicable codes, standards, regulations, notices, SDSs, air monitoring results, the AAC's approved AHAP, and other pertinent documents.
- B. Employee Training
- 1. All persons involved in asbestos work must have received training required by 29 CFR 1926.1101, 40 CFR 763, 8 AAC 61, and any other applicable state or local regulations.
 - 2. Persons performing, designing, directly supervising, or monitoring asbestos abatement work must have a current State of Alaska Asbestos Abatement Certificate of Fitness in accordance with 8 AAC 61.600.
 - 3. Submit proof of current accreditation for persons who received training under 40 CFR 763 and submit copies of current State of Alaska Asbestos Abatement Certificates of Fitness. Organize certificates by individual worker, not grouped by type of certification.
 - 4. Due to the potential to contact asbestos-containing materials in project areas throughout this site, personnel performing work at this site are required to have a minimum of "two-hour asbestos awareness training" in accordance with 29 CFR 1926.1101 and 40 CFR 763. Proof of this training must be maintained onsite for the duration of the project but is not required to be submitted by this section. Only personnel who are trained and State-accredited as an EPA Worker or EPA Contractor/Supervisor are permitted to disturb asbestos-containing materials.
 - 5. Additional training related to health, safety, and environmental issues may be required, and it is the responsibility of the AAC, the AAC's Competent Person, the GC, and the CPIH to identify those additional issues and to recommend training as necessary to ensure compliance with applicable regulations.
- C. Competent Person
- 1. All asbestos work must be performed under the supervision of a Competent Person as defined by 29 CFR 1926.1101 who additionally has documented experience and training including, but not limited to, the administration and supervision of asbestos abatement projects including exposure assessments and monitoring, work practices, abatement methods, protective measures for personnel, setting up and inspecting asbestos abatement work areas, evaluating the integrity of containment barriers, placement and operation of local exhaust systems, ACM generated waste containment and disposal procedures, decontamination unit installation and maintenance requirements, site safety and health requirements, and notification of other employees onsite.
 - 2. The Competent Person must be on-site at all times when asbestos abatement activities are being performed.
 - 3. Certify in writing that the proposed Competent Person meets the minimum requirements of this section and submit evidence to support such certification. Examples of acceptable documentation include, but are not limited to, resumes, training documentation, or descriptions of prior experience supervising or performing asbestos abatement work.
- D. Affidavit of Medical Surveillance, Respiratory Protection, and Training Accreditation
- 1. Provide a written statement certifying that the following records are current and available on request for all persons engaged in asbestos work:
 - a. Evidence of training on the contents of 29 CFR 1926.1101, 40 CFR 763, and other related training required by federal, state, or local agencies.
 - b. Evidence of training on the contents of the AAC's written Respiratory Protection Program and the requirements of 29 CFR 1910.134 and its appendices.
 - c. Documentation of medical evaluations and determinations, respirator fit tests, and associated recordkeeping required by 29 CFR 1926.103 and 29 CFR 1926.1101.

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- E. AAC License and Insurance
1. Submit a copy of the AAC's license issued by the State of Alaska and a copy of their insurance policy, including exclusions, with a letter from their agent stating in plain language the coverage provided and the fact that asbestos abatement activities are covered by the policy.
- F. Contractor's Professional Industrial Hygienist (CPIH); Independent Industrial Hygiene Technician (IIHT)
1. Submit the following information for the Contractor's Professional Industrial Hygienist (CPIH):
 - a. The name, address, and telephone number of the CPIH.
 - b. Evidence of current training and accreditation as a Building Inspector and Contractor/Supervisor Abatement Worker as described by 40 CFR 763.
 - c. Current State of Alaska Asbestos Abatement Certificate of Fitness in accordance with 8 AAC 61.600.
 - d. Evidence of successful completion of the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent.
 - e. If performing onsite analysis of Phase Contrast Microscopy air samples, the CPIH must be currently registered as an Asbestos Analyst and affiliated with a Registered Organization under the American Industrial Hygiene Association (AIHA) Asbestos Analyst Registry (AAR).
 - f. Alternatively, onsite analysis of Phase Contrast Microscopy air samples may be permitted if the CPIH participates as an asbestos analyst in their laboratory's Industrial Hygiene Proficiency Analytical Testing (IHPAT) program and evidence showing their satisfactory performance in the last four rounds of the program is submitted.
 2. Submit the following information for the Independent Industrial Hygiene Technician (IIHT):
 - a. The name, address, and telephone number of the IIHT.
 - b. Evidence of current training and accreditation as a Contractor/Supervisor Abatement Worker as described by 40 CFR 763.
 - c. Current State of Alaska Asbestos Abatement Certificate of Fitness in accordance with 8 AAC 61.600.
 - d. Evidence of training on the contents of ASTM E1368 and 40 CFR 763.
 - e. A written statement certifying that the IIHT and IIHT's employer are completely independent of the AAC and have no employee or employer relationship which could constitute a conflict of interest.
- G. Testing Laboratory
1. The minimum analytical capabilities required for the asbestos work under this contract include:
 - a. National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods (NMAM) Method 7400: Asbestos and Other Fibers by Phase Contrast Microscopy.
 - b. National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods (NMAM) Method 7402: Asbestos by Transmission Electron Microscopy.
 - c. United States Environmental Protection Agency Method 600, R93-116: Determination of Asbestos in Bulk Building Materials by Polarized Light Microscopy.
 - d. United States Environmental Protection Agency "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Non-Mandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR 763, Subpart E, Appendix A.

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2. Submit the following information for each testing laboratory:
 - a. The name, address, and telephone number of the testing laboratory.
 - b. The testing laboratory's current American Industrial Hygiene Association Laboratory Accreditation Programs (AIHA LAP) certificate of accreditation; scope of accreditation; and the most recent Proficiency Testing Performance Report for the Industrial Hygiene Proficiency Analytical Testing (IHPAT) program showing the testing laboratory as "Proficient" for the "Asbestos Analyte Class" in the "Overall Performance Summary".
 - c. A listing of the testing laboratory's microscopists showing evidence of successful completion of the National Institute of Occupational Safety and Health (NIOSH) 582 course "Sampling and Evaluating Airborne Asbestos Dust" or equivalent; participation in and satisfactory performance under the IHPAT program; and Asbestos Analyst Testing (AAT) Performance Results Report for AAR participants.
 - d. The testing laboratory's current certificate of accreditation and scope of accreditation issued under the National Institute of Standards and Technology (NIST) National Voluntary Laboratory Accreditation Program (NVLAP) for analysis of asbestos in bulk samples and for analysis of asbestos by Transmission Electron Microscopy in accordance with 40 CFR 763, Subpart E, Appendix A.
 - e. The testing laboratory must be independent of the asbestos contractor and must have no employee or employer relationship which could constitute a conflict of interest.
- H. Notifications
 1. Submit copies of notifications to the Alaska Department of Labor required by 8 AAC 61.620 showing approval by the department.
 2. Submit copies of notifications to the regional EPA authority required by 40 CFR 61 Subpart M. Note this may include more than one notification and may include trades other than the Asbestos Abatement Contractor.
- I. Waste Transporter
 1. Submit written evidence that the transporter is approved to transport asbestos waste in accordance with the requirements of 49 CFR 171, 49 CFR 172, and 49 CFR 173 as well as and all other state and local regulatory agency requirements.
- J. Waste Disposal Site
 1. Submit written evidence that the landfill is approved for asbestos disposal by the regional EPA authority and local regulatory agencies along with a certification that the Contractor has consulted with the proposed landfill to determine any specific requirements which may be more stringent than those found within this specification, including if pre-authorization is required.
 2. If the proposed landfill requires pre-authorization to dispose of asbestos wastes, submit copies of those authorizations as evidence of compliance with the landfill's requirements.

1.11. DETAILS OF REQUIRED PERIODIC SUBMITTALS

- A. Sampling Results:
 1. Submit the following information for all sampling events, regardless of the type of sampling:
 - a. The printed name and signature of the individual who conducted the sampling and their certification names, numbers, and expiration date relevant to the type of sampling performed.
 - b. The date the samples were collected.

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- c. The requested analytical method.
 - d. The sample prefixes, numbers, descriptions, and other unique identifying information.
 - e. Field logs associated with the sampling.
 - f. Drawings showing the locations of all sampling locations.
 - g. Chain of custody documentation for the samples.
 - h. A finalized report from the testing laboratory showing the name and location of the testing laboratory, the dates of analysis, the name of the analysts, the analytical method used, and the results of the analysis for all samples. The finalized report must be signed by the analyst.
2. Submit the following additional information for all air sampling events, regardless of the type of air sampling:
 - a. Purpose/type of air sample (e.g. personnel, inside or outside work area, baseline, clearance, etc.).
 - b. For personnel monitoring, the name of the person being monitored, their work activities, and the type of PPE being worn.
 - c. The type of sampling cassette or media used.
 - d. The locations of samples and activities being performed during the sampling period.
 - e. Sampling pump manufacturer, model number, and serial number.
 - f. Beginning flow rate, end flow rate, and average flow rate (L/min).
 - g. Equipment and equipment identifier (serial number, etc.) used to calibrate flow rates.
 - h. Sample period start time, stop time, and elapsed time (in minutes).
 - i. Total air volume sampled (liters).
 3. Submit the following additional information for all clearance air sampling events:
 - a. Signed and completed final visual inspection forms.
 4. Documentation for all sampling events must be submitted to the Owner within 24 hours of receiving the finalized laboratory results.
- B. Work area inspections and clearances:
1. Documentation of final visual inspections must:
 - a. Include the time and date of the inspection.
 - b. The name, signature, and the State of Alaska Asbestos Abatement Certificate of Fitness number and expiration date of the IIHT conducting the inspection.
 - c. The IIHT's client which authorized the inspection.
 - d. The name of the GC, the AAC, and the AAC's Competent Person.
 - e. A written description of the location the inspection is being performed.
 - f. A sketch or drawing of the location the inspection is being performed.
 - g. Indicate whether the work area was satisfactorily cleaned or indicate that the work area was not satisfactorily cleaned.
 - h. If the work area was satisfactorily cleaned, include a statement that the work area is ready for clearance air monitoring.
 - i. If the work area was not satisfactorily cleaned, indicate the deficiencies noted and the recommended corrective actions to be taken.
 - j. If encapsulants are used, and if those encapsulants were tinted, indicate the color which was used to tint the encapsulant and/or what color the encapsulant appears after drying.
 - k. Be uniquely labeled or titled so that it can be referenced by other documentation.
 2. Clearance air monitoring documentation must:
 - a. Indicate the unique label or title of the satisfactory final visual inspection for the work area.
 - b. Indicate whether encapsulant was used, and if so, indicate whether the encapsulant has touched the touch.

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- c. Include a statement that the clearance air samples were collected using aggressive means.
 - d. Include all other sampling documentation required by this section.
 3. Documentation for all work area inspections and clearance events must be submitted to the Owner within 24 hours of receiving the finalized laboratory results.
- C. Project Logs:
 1. Submit all project logs no later than 24 hours after the end of shift.
 2. The AAC's written daily log must include:
 - a. The date and time the work took place.
 - b. The name and signature of the Competent Person.
 - c. The name of the CPIH and a description of the type(s) of sampling and inspections performed by the CPIH.
 - d. A description of the work being performed.
 - e. A sketch or drawing showing the location of the work being performed.
 - f. The types and quantities of asbestos-containing materials removed.
 3. Regulated area sign-in sheets must include:
 - a. The date and time the work took place.
 - b. The name and signature of the Competent Person.
 - c. A description of where the work is being performed, and if more than one regulated area is present, which regulated area the sign-in sheet applies to.
 - d. The name and signature of each person entering and exiting the regulated work area.
 - e. The State of Alaska Asbestos Abatement Certificate of Fitness number for each person entering and exiting the regulated work area.
 4. Pressure differential recordings for Negative Pressure Enclosures.
- D. Submit updates to the preconstruction submittals generated during the work.

1.12. DETAILS OF REQUIRED CLOSEOUT SUBMITTALS

- A. Completed waste transport records must include:
 1. All information described in 40 CFR 61.150(d).
 2. A unique identifying number which can be traced to a disposal site receipt.
- B. Disposal site receipts must include:
 1. The name, address, and telephone number of the disposal site.
 2. The date and time the asbestos wastes were received by the disposal site operator.
 3. The name and signature of the disposal site operator's personnel who received the asbestos wastes.
 4. A unique identifying number which can be traced to a waste shipment record.
- C. In addition to these submittals, the closeout submittals shall include all updates to previously submitted information as necessary to ensure the documentation requirements of this section are fulfilled.

1.13. PERFORMANCE REQUIREMENTS FOR SUBMITTALS

- A. All types of submittals must be submitted as a "submittal package" with all required documentation for the type of submittal, must be reasonably organized, and must not contain duplicate information or other information not required by this section. Piecemeal submittals, incomplete submittals, disorganized submittals, or submittals containing duplicative or unnecessary information will be rejected without review and returned to the AAC and/or GC for revision.

- B. The AAC and GC must provide the initial Pre-Construction Submittal package required by this section to the Owner no less than 14 days prior to the planned start of work.
- C. Periodic Submittals must be provided to the Owner within the timeframes specified for each submittal item. Where no timeframe is provided, the Periodic Submittals must be provided at least weekly.
- D. The AAC and GC must provide the initial Closeout Submittal package required by this section to the Owner no later than 14 days after demobilization from the site by the AAC.
- E. The performance requirements for submittals apply to each construction season and phase separately.
- F. The Owner will provide written acceptance or rejection of all submittals no later than 10 days after receiving the submittals.
- G. Failure to deliver submittals in accordance with these performance requirements and/or failure to submit any documentation required by this section may result in the withholding of payment until such time a resolution has been reached to the satisfaction of the Owner.

PART 2 – PRODUCTS

2.1. GENERAL

- A. The AAC and GC must provide and maintain a sufficient quantity of materials and equipment required to complete the work of the project. This may include, but is not limited to, HEPA vacuums, scrapers, sprayers, nylon brushes, brooms, disposable mops, rags, sponges, staple guns, shovels, ladders and scaffolding of suitable height and length, fall protection devices, water hoses, airless spray equipment, and any other tools, materials or equipment required to conduct the asbestos work.
- B. All products used during the work must be used in strict accordance with the manufacturer's instructions.
- C. Store all materials subject to damage off the ground, away from wet or damp surfaces and under cover sufficient enough to prevent damage or contamination.
- D. Flammable and combustible materials must not be stored inside of any structure, and if stored elsewhere onsite, must be stored in a container specifically designed for the storage of such materials.
- E. Provide Ground-Fault Circuit Interrupters (GFCI) for all electrical equipment.
- F. All electrical-related work must be performed by a licensed electrician.

2.2. AIR MONITORING EQUIPMENT

- A. The CPIH must provide and approve air monitoring equipment. The equipment must include, but must not be limited to:
 - 1. High-volume sampling pumps that can be calibrated and operated at a constant airflow up to 16 liters per minute.
 - 2. Low-volume, battery powered, body-attachable, portable personal pumps that can be calibrated to a constant airflow of 0.5 to 3.5 liters per minute, and a self-contained

rechargeable power pack capable of sustaining the calibrated flow rate for a minimum of 8 hours. The pumps must also be equipped with an automatic flow control unit which must maintain a constant flow, even as filter resistance increases due to accumulation of fiber and debris on the filter surface.

3. Commercial grade air sampling cassettes and labels designed for use with the type of air monitoring being performed.
4. An air flow calibrator having traceable to an NIST primary standard.
5. Tubing designed for use in occupational air monitoring applications.
6. Stands, tape, templates, wipes, bags, shipping containers, chain of custody documents, and all other equipment necessary to the type of sampling being performed.

2.3. BACKUP ELECTRICAL SOURCES

- A. Provide at least one backup electrical source, such as a standby or backup generator, independent of the building's electrical systems and any other primary electrical systems established by the GC, which has sufficient capacity and rating to supply the maximum expected electrical demand of all electrical devices required to run continuously during the abatement work, including, but not limited to negative air machines, pressure differential monitoring devices, and other critical systems.

2.4. CHEMICALS

- A. Maintain Safety Data Sheets (SDS) at the jobsite for all hazardous chemicals under OSHA 29 CFR 1926.59 - Hazard Communication and 8 AAC 61.1110 - Additional Hazard Communication Standards.
- B. Mastic removing solvent must be compatible with replacement materials, must be nonflammable, and must not contain methylene chloride, glycol ether, or halogenated hydrocarbons. Solvents used onsite must have a flash point greater than 140 degrees F.
- C. Chlorinated compounds shall not be used with any spray adhesive, mastic remover or other product.
- D. Water used for asbestos abatement must be amended using wetting agents or surfactants specifically designed for such use.
- E. All types of encapsulant (bridging, penetrating, lock-down, high-temperature, removal, etc.) must be specifically designed for use in asbestos encapsulation applications, non-flammable, non-combustible, non-toxic, and must be compatible with all replacement products.

2.5. DECONTAMINATION AREA

- A. Provide decontamination areas in accordance with 29 CFR 1926.1101(j).

2.6. DISPOSAL CONTAINERS

- A. All disposal containers for asbestos wastes must:
 1. Be leak-tight.
 2. Use a minimum of 6-mil polyethylene.
 3. Be labeled in accordance with 29 CFR 1926.1101(k)(8); 40 CFR 61.149(d)(1) and 40 CFR 61.149(e)(1); 40 CFR 61.150(a)(1); 40 CFR Appendix D to Subpart E of Part 763; and 49 CFR 172.101.

4. Be weatherproof and must be preprinted on the disposal container or affixed directly to the disposal container.
5. Meet any additional requirements of the disposal site operator.

2.7. DUCT TAPE

- A. Use commercial grade duct tape which is compatible with existing substrates and materials being used; capable of withstanding the forces encountered during the work, such as for air movement, the weight of water, equipment, personnel, and materials, from punctures, and other expected forces; and that is capable of maintaining bonding strength in wet or dry conditions throughout the temperature extremes expected to be encountered during the work.

2.8. GLOVEBAGS AND GLOVEBOXES

- A. All glovebags must meet or exceed the following minimum specifications:
 1. Must not be larger than 60" x 60".
 2. Must have glove-like appendages through which materials and tools may be handled.
 3. Must be a minimum of 6-mil thick.
 4. Must be seamless at the bottom.
 5. Must be used without modification.
- B. All gloveboxes must meet or exceed the following minimum specifications:
 1. Must have rigid sides and made from metal or other material which can withstand the weight of the materials, tools, and water used during removal.
 2. Must use a minimum of 6-mil thick polyethylene sheeting.
 3. Must have a negative pressure generator capable of maintaining negative pressure in the system.
 4. Must have an air filtration unit attached to the glovebox.
 5. Must be fitted with gloved apertures.
 6. Must have an aperture at the base of the box of adequate size to serve as a bagging outlet for waste asbestos and water.

2.9. HEPA FILTERS

- A. Use only HEPA filters certified as capable of capturing particulates of 0.3 microns with 99.97% efficiency when tested in accordance with UL 586, IEST-RP-series, or MIL-STD-282. HEPA filters must be labeled with the certifying organization.
- B. All equipment using HEPA filters must be designed so that all the air drawn into the equipment is expelled through one or more HEPA filters with none of the air leaking past any portion of the equipment prior to passing through the HEPA filters.

2.10. LABELS

- A. Use warning labels which comply with 29 CFR 1926.200; 29 CFR 1926.1101(k)(8); 40 CFR 763.95; 49 CFR 172.101; and ANSI Z535 series standards.

2.11. LOCAL EXHAUST VENTILATION

- A. Use HEPA-filtered local exhaust ventilation meeting or exceeding the performance requirements of ASSP Z9.2.

2.12. NEGATIVE AIR MACHINES

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- A. Use HEPA-filtered negative air machines which are capable of meeting or exceeding the performance requirements for Negative Pressure Enclosure in 29 CFR 1926.1101(g)(5)(i).

2.13. PERSONAL PROTECTIVE EQUIPMENT (PPE)

A. General

- 1. Provide and maintain a sufficient quantity of Personal Protective Equipment (PPE) designed to protect the ears, eyes, face, head, body, lungs, and extremities to all employees engaged in asbestos removal work in accordance with the requirements of 29 CFR 1926.28, 29 CFR 1926.1101, 29 CFR 1926 Subpart E, and other sections of 29 CFR Part 1926 as applicable.
 - 2. Required PPE for persons engaged in asbestos removal work is anticipated to include, but not be limited to, respiratory protective devices, protective clothing, gloves, protective footwear, eye and face protections, hearing protection, fall protection, protective shields, and barriers. Additional PPE must be provided to persons engaged in asbestos abatement work as necessary to protect those employees due to situations such as: other conditions which may be present at the site, conditions caused as a result of the AAC's choice of means and methods to complete the work, or due to hazards which are incidental to the asbestos work. The AAC must perform an assessment of the potential hazards present for each work task being performed and must provide PPE as necessary to protect employees and others from those hazards. The assessments must be documented in writing and maintained at the work site. The elements of the assessment may include, but are not limited to, those elements described in Appendix B to 29 CFR 1910.120; Appendix B to Subpart I of 29 CFR 1910; OSHA Publication 3071 for Job Hazard Analysis; or in USACE EM 385-1-1.
 - 3. PPE must be of commercial quality, bear the manufacturer's name, and certified to meet or exceed any performance and labeling requirements specified by applicable regulations. Examples which demonstrate compliance with this requirement include, but are not limited to:
 - a. Respirators which are approved for use by NIOSH in accordance with 42 CFR 84 and meet the requirements of ANSI/ISEA Z88 series standards.
 - b. Protective ensembles which are certified by NFPA 1990.
 - c. Protective clothing meeting the requirements of ANSI/ISEA 101.
 - d. Foot protection meeting the requirements of ASTM F2412 and ASTM F2413.
 - e. Hand protection meeting the requirements of ANSI/ISEA 105.
 - f. Eye and face protection meeting the requirements of ANSI/ISEA Z87.1.
 - g. Head protection meeting the requirements of ANSI/ISEA Z89.1.
 - h. Protective equipment meeting the requirements of ISO 13.340
- B. Provide the Owner or representative of an authority having jurisdiction with at least two complete sets of personal protective equipment as required for entry into and inspection of all areas of the regulated work area.
 - C. Select and use respiratory protective devices in accordance with 1926.1101(h)(3).
 - D. Breathing air quality and use must meet the requirements of 29 CFR 1910.134(i).

2.14. POLYETHYLENE SHEETING

- A. All polyethylene sheeting used for asbestos-related purposes including, but not limited to, the containment of regulated work areas, construction of decontamination areas, isolation of HVAC systems, as a drop cloth, glovebags, disposal containers and liners, etc. must meet the following minimum requirements:
 - 1. Be 6-mil thick or greater.

2. Must be impermeable.
3. Meet the performance requirements of ASTM E84, ASTM D4397 or ASTM D4801, and NFPA 701.

2.15. PRESSURE DIFFERENTIAL MONITORING DEVICE

- A. Provide a pressure differential monitoring device for asbestos work conducted in Negative Pressure Enclosures. The device must:
 1. Be capable of continuous operation.
 2. Be capable of measuring pressure differential in a minimum range of +0.25" to -0.25" of water column.
 3. Have a continuous data logging feature which can store measurements in electronic format, record measurements on physical printouts, or both.
 4. Be capable of setting alarm setpoints.
 5. Have audible and visual alarm or be able to signal these alarms.

2.16. SANITATION SYSTEMS

- A. Provide potable water; nonpotable water; toilets; food handling; temporary sleeping quarters; washing facilities; eating and drinking areas; vermin control; and change rooms in accordance with 29 CFR 1926.51 and 29 CFR 1926.1101(j).

2.17. VACUUMS

- A. Use vacuums which have been designed with a HEPA filter as the last filtration stage. The vacuum cleaner must be designed so that all the air drawn into the machine is expelled through the HEPA filter with none of the air leaking past it. HEPA vacuums must be operated and maintained in accordance with the manufacturer's instructions.

2.18. WARNING SIGNS AND TAPE

- A. Use warning signs and tape which comply with 29 CFR 1926.200; 29 CFR 1926.1101(k)(7); and ANSI Z535 series standards.

2.19. WATER FILTRATION EQUIPMENT

- A. Provide water filtration equipment specifically designed to treat wastewater from asbestos abatement activities to a minimum treatment standard of 7,000,000 asbestos fibers per liter. The equipment must have a minimum of two filtration stages with one 20 micron and one 5 micron filter.

PART 3 – EXECUTION

3.1. GENERAL

- A. No work covered by this section may commence until all required Preconstruction Submittals have been approved, a pre-construction meeting held, the pre-work inspections have been completed, and a written authorization to proceed with the work is provided by the Owner.
- B. In addition to the requirements of this section, the AAC and GC must:
 1. Notify other employers of the nature of the asbestos work, the existence of and requirements pertaining to regulated areas, and the measures taken to ensure that employees of such other employers are not exposed to asbestos, and must comply

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with all other requirements for multi-employer worksites in accordance with 29 CFR 1926.1101(d).

2. Establish, demarcate, and control access to regulated areas; ensure the proper use of respiratory protection within regulated areas; ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated area; and must ensure a Competent Person supervises all work performed within regulated areas in accordance with 29 CFR 1926.1101(e) as applicable to the class of asbestos work being performed.
3. Perform all exposure assessments and monitoring in accordance with 29 CFR 1926.1101(f), except where this section designates those responsibilities, or portions of those responsibilities, to the CPIH or the IIHT.
4. Comply with the minimum methods of compliance in accordance with 29 CFR 1926.1101(g) as applicable to the class of asbestos work being performed.
5. Provide respiratory protection to employees; implement and maintain a written Respiratory Protection Program; and select respiratory protection in accordance with 29 CFR 1926.1101(h).
6. Comply with the additional respiratory protection standards of 8 AAC 61.1030.
7. Provide protective clothing in accordance with 29 CFR 1926.1101(i).
8. Provide hygiene facilities and ensure the proper use of those facilities in accordance with 29 CFR 1926.1101(j).
9. Communicate information on asbestos hazards in construction in accordance with 29 CFR 1926.1101(k).
10. Comply with the housekeeping requirements in accordance with 29 CFR 1926.1101(l).
11. Provide medical surveillance to employees in accordance with 29 CFR 1926.1101(m).
12. Comply with the recordkeeping requirements in accordance with 29 CFR 1926.1101(n); 40 CFR 61 Subpart M; 40 CFR 763; 49 CFR 172 Subpart C; and any additional requirements of this section.
13. Designate a Competent Person in accordance with 29 CFR 1926.1101(o).
14. Use the work practices and engineering controls found in Appendix F to 29 CFR 1926.1101 for all work requiring the use of a Negative Pressure Enclosure.
15. Comply with the notification requirements and asbestos emission control procedures in accordance with 40 CFR 61.145.
16. Comply with waste disposal requirements in accordance with 40 CFR 61.150 and 18 AAC 60.450.
17. Comply with all applicable requirements of 40 CFR 763 Subpart E and its appendices.
18. Comply with applicable codes and requirements related to fire protection and prevention, emergency egress, first aid, and other similarly related elements.

3.2. PRE-WORK ACTIVITIES

- A. The Contractor must perform the following pre-work inspections and preparations prior to starting any work covered by this section:
 1. With the assistance of the Owner, determine if there are any special or unique conditions within the work area, such as controls or equipment which may require access during the abatement by non-abatement personnel, that may necessitate modification or revision of the Contractor's approved Asbestos Hazard Abatement Plan.
 2. Determine the extents of each individual work area and the work to be performed within those areas, and confirm that the conditions, work areas, and work to take place is in accordance with the Contractor's approved Asbestos Hazard Abatement Plan. If materials are identified that may be contacted or disturbed by the work that are not classified as asbestos-containing or non-asbestos-containing in the Hazardous Materials Assessment, the CPIH must collect bulk samples of those materials in accordance with this section.

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3. Conduct a space-by-space inspection with the Owner and prepare a written inventory of all existing damage in those spaces where asbestos abatement will occur. Still or video photography may be used to supplement the written inventory of existing damage. Documentation must be signed and certified as accurate by both parties.
4. If the AHAP or other submittal elements required by this section require modification or revision due to discoveries made during the pre-work inspections and preparations, the Contractor must submit those modifications and/or revisions to the Owner for review and approval prior to starting work.

3.3. PRE-WORK NOTIFICATIONS AND AUTHORIZATIONS

- A. The Contractor must submit a "Notification of Demolition and Renovation" to the EPA Region X NESHAP coordinator at least 10 working days prior to starting the work if required by 40 CFR 61.145. The notification must be updated periodically if the amount of asbestos affected changes by at least 20 percent, if the start or end dates change, or as otherwise required by 40 CFR 61.145(b).
- B. The Contractor must submit notification to, and receive approval from, the Alaska Department of Labor (DOL) in accordance with 8 AAC 61.620(b).
- C. If required by the disposal site, obtain written authorization to dispose of asbestos wastes.

3.4. PRE-CLEANING AND WORK AREA PREPARATION ACTIVITIES

- A. There is no requirement to remove all pre-existing asbestos-containing dusts or debris from the site unless noted otherwise and elsewhere in this section or the contract documents, or if it is necessary to complete the work in accordance with this section, or because the AAC or GC determines it to be a more cost-effective means of completing the work.
- B. Moveable objects remaining in the work area which the Owner chooses to leave in place must be removed prior to establishing the regulated area unless those objects are contaminated by asbestos. Asbestos-contaminated moveable objects which are cleanable and can be decontaminated using Class IV work methods in accordance with 29 CFR 1926.1101 may be cleaned and removed prior to establishing the regulated area. Noncleanable moveable objects or objects which cannot be cleaned using Class IV work methods must remain in the regulated area and be decontaminated or disposed of after the regulated area has been established.
- C. Non-moveable objects, fixed objects, and remaining exposed surfaces in the work area which are cleanable and can be decontaminated using Class IV work methods in accordance with 29 CFR 1926.1101 must be cleaned using a HEPA filtered vacuum and/or wet cleaning methods prior to establishing the work area. Non-moveable objects, fixed objects, or remaining surfaces which cannot be cleaned using Class IV work methods must be decontaminated or removed and disposed of after the regulated area has been established.
- D. Objects and surfaces remaining in the work area after the precleaning activities have been completed must be covered and protected using a minimum of 2 layers of polyethylene sheeting and sealed using duct tape, spray adhesive, or other approved method.

3.5. SPECIFIC REQUIREMENTS OF THIS SECTION

- A. All work covered by this section that is performed indoors must be performed within a regulated area using critical barriers as a minimum.
 1. Exceptions to this requirement:
 - a. Class IV asbestos work.

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- b. Intact removal of asbestos-containing material.
 - c. Buildings scheduled for complete demolition which will not be reoccupied after abatement and prior to demolition.
 - d. Work classified as small-scale short-duration.
 - e. Isolated glovebag or glovebox work.
- B. Work which includes the removal or disturbance of asbestos-containing roof coatings, cements, and mastics is required by this section to be performed as a Class II asbestos operation.
- C. Reliance on OSHA's "Flooring Settlement Agreement" as justification to reduce the minimum work area protections required by this section is prohibited.
- D. The following materials are classified by this section as a Regulated Asbestos-Containing Material:
- 1. Asbestos-containing sheet vinyl and its associated mastics and leveling compounds, or any materials contaminated by these items.
 - 2. Loose fill vermiculite insulation.
- E. Negative air machines and local exhaust ventilation must not use any building HVAC systems as a means of transporting air into or out of the regulated areas; must exhaust to the exterior of the building, no less than 30 feet away from building HVAC intakes, and must be exhausted to an area with the least amount of personnel traffic to the greatest extent practicable.
- F. Work conducted adjacent to occupied areas must be obscured from those occupants to the greatest extent practicable.
- G. The AAC must document all work covered by this section they perform on a written daily log.
- H. All regulated work areas must maintain a sign-in sheet to record all persons entering and exiting the regulated work area.
- I. All asbestos-containing wastes removed from the site, including those classified as Category I Non-Friable ACM, Category II Non-Friable ACM, RACM, and materials containing asbestos at a concentration of less than or equal to 1% asbestos must have a waste shipment record and a disposal receipt indicating receipt by the disposal site operator.
- J. Where encapsulants are used, and when the area or components where they are used will not be visible to normal building occupants after the completion of construction, the encapsulant must be tinted with a unique color in a manner which does not obscure underlying substrates.

3.6. BULK SAMPLING REQUIREMENTS

- A. Any materials requiring bulk sampling by this section must meet the following minimum bulk sampling requirements for each homogeneous area:
- 1. Surfacing materials:
 - a. At least three (3) bulk samples shall be collected from each homogeneous area that is 1,000 square feet or less.
 - b. At least five (5) bulk samples shall be collected from each homogeneous area that is greater than 1,000 square feet but less than or equal to 5,000 square feet.
 - c. At least seven (7) bulk samples shall be collected from each homogeneous area that is greater than 5,000 square feet.

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- d. At least one (1) additional bulk sample for every additional 1,000 square feet of material.
2. Thermal System Insulation (TSI):
 - a. At least three (3) bulk samples shall be collected from each homogeneous area of TSI.
 - b. At least one (1) bulk sample from each homogeneous area of patched thermal system insulation if the patched section is less than 6 linear or square feet.
 - c. In a manner sufficient to determine, which must include at least two (2) bulk samples, from each insulated mechanical system where cement or plaster is used on fittings such as tees, elbows, or valves.
 - d. Bulk samples are not required to be collected from any homogeneous area where the accredited inspector has determined that the thermal system insulation is fiberglass, foam glass, rubber, or other non-ACBM.
3. Miscellaneous materials:
 - a. At least two (2) bulk samples shall be collected from each homogeneous area that is less than 500 square feet.
 - b. At least three (3) bulk samples shall be collected from each homogeneous area that is greater than or equal to 500 square feet but less than 1,000 square feet.
 - c. At least five (5) bulk samples shall be collected from each homogeneous area that is greater than 1,000 square feet but less than or equal to 5,000 square feet.
 - d. At least seven (7) bulk samples shall be collected from each homogeneous area that is greater than 5,000 square feet.
 - e. At least one (1) additional bulk sample for every additional 1,000 square feet of material.

3.7. AIR MONITORING

- A. General
 1. For all work covered by this section which requires the establishment of a regulated area, air monitoring must be performed.
 2. Air monitoring must be performed at all times work covered by this section is being conducted for the duration of the project.
 3. Air monitoring must be performed by the CPIH.
 4. The CPIH must submit lab blanks and field blanks in accordance with the requirements of the analytical method being used.
 5. The quantities and types of air monitoring required by this section are the minimum requirements and apply to each regulated area and each shift separately.
 6. A reduction of monitoring may be permitted at the discretion of the Owner upon written request from the CPIH. Modifications to any air monitoring procedures required by this section are prohibited unless the Owner issues a written authorization stating their acceptance of the proposed modifications. No modifications are allowed prior to receiving such authorization.
 7. The minimum air monitoring requirements of this section apply to each regulated area and each shift separately.
 8. Air monitoring is not required by this section for intact removal of asbestos-containing materials.
 9. Air samples collected for analysis by NIOSH 7400 must have a sufficient volume of air drawn through the filter media to establish a minimum level of detection of less than 0.01 f/cc.
- B. Air monitoring for the purpose of establishing background levels of airborne asbestos concentrations by NIOSH 7400 is not required by this section but may be performed at the discretion of the Contractor.
- C. Monitoring of personnel:

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1. Monitoring of personnel must be performed in accordance with 29 CFR 1926.1101.
- D. For all interior work, and for exterior work which cannot be performed using non-aggressive means, air monitoring during the work must include:
1. A minimum of three (3) air samples from within the regulated area boundaries.
 2. A minimum of three (3) air samples from areas outside of but adjacent to the regulated area boundaries.
 3. One (1) air sample at the entrance to the regulated area.
 4. One (1) air sample at the waste loadout area during waste loadout operations.
 5. One (1) air sample at the approximate location of HEPA exhaust discharge.
- E. For exterior work performed using non-aggressive means, air monitoring during the work must include:
1. A minimum of two (2) air samples from within the regulated area boundaries.
 2. A minimum of two (2) air samples from areas outside of but adjacent to the regulated area boundaries.
- F. For work classified as small-scale short-duration and where the employer has not completed a Negative Exposure Assessment for the work operation in accordance with 29 CFR 1926.1101(f)(2), air monitoring during the work must include:
1. A minimum of one (1) air sample taken from each of the employee's breathing zone.
 2. A minimum of two (2) air samples collected directly adjacent to where the removal work is taking place.

3.8. WORK AREA INSPECTIONS AND CLEARANCES

- A. General:
1. All clearance air monitoring and final visual inspections must be performed by the IIHT.
 2. Final visual inspections must be performed at the completion of all asbestos removal activities, including for intact removal, exterior removal, work classified as small-scale short-duration, and any other work which disturbs and removes any quantity of asbestos from any location of the site.
 3. The final visual inspection must be thorough and performed in accordance with the protocols found in ASTM E1368 and 40 CFR 763.
 4. All final visual inspections and clearance air monitoring must be documented in writing.
 5. Clearance air monitoring is required for all work conducted inside of regulated areas unless noted otherwise by this section.
 6. If the work area requires the use and application of encapsulants of any type, clearance air monitoring may not begin until the applied encapsulant is dry to the touch.
 7. All clearance air monitoring must be performed using aggressive methods as described in Appendix A to 40 CFR 763 Subpart E.
 8. The IIHT must submit lab blanks and field blanks in accordance with the requirements of the analytical method being used.
 9. The quantities and types of air monitoring required by this section are the minimum requirements and apply to each regulated area separately.
 10. Onsite analysis of clearance air samples is prohibited.
 11. Clearance air monitoring is not required by this section for intact removal of asbestos-containing materials or for exterior asbestos removal activities.
 12. If any of the clearance air samples fails clearance criteria, the work area must be recleaned, receive an additional final visual inspection, and clearance air monitoring repeated.

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13. All regulated work areas must retain their status as a regulated work area until the Owner provides written notice that the work area may be deregulated.
- B. TEM clearance air monitoring:
1. Must be performed in accordance with the United States Environmental Protection Agency "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Non-Mandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR 763, Subpart E, Appendix A.
 2. Is required for all Class I asbestos work requiring the removal of greater than 25 linear feet or 10 square feet of asbestos-containing material.
 3. Is required for all work requiring the removal of greater than 10 square feet of asbestos-containing resilient floor coverings and their associated mastics and leveling compounds, or for the removal of any materials contaminated by these items.
 4. Is required for all other interior work requiring the removal of greater than 160 linear feet or 260 square feet of asbestos-containing material.
 5. Must include a minimum of five (5) clearance air samples from within the regulated area boundaries.
 6. Each TEM clearance air sample collected must meet the pass/fail criteria in 40 CFR 763.90(i)(4). Averaging of the analytical results to achieve passing criteria is prohibited by this section.
- C. PCM clearance air monitoring:
1. Must be performed in accordance with the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods (NMAM) Method 7400: Asbestos and Other Fibers by Phase Contrast Microscopy.
 2. May be performed for all other interior work which is not required to have TEM clearance air monitoring.
 3. Must include a minimum of five (5) clearance air samples from within the regulated area boundaries.
 4. Each PCM clearance air sample collected must meet the pass/fail criteria in 40 CFR 763.90(i)(5). Reanalysis of failed PCM clearance air samples using NIOSH NMAM TEM Method 7402 for the purposes of determining if passing clearance criteria has been achieved is prohibited by this section.
- 3.9. POST-WORK ACTIVITIES
- A. The AAC must visually inspect areas impacted by their work activities for potential asbestos-containing dust or debris that may have been concealed after all regulated area protections, equipment, supplies, and other objects within their possession have been removed from those areas. If any asbestos-containing dust or debris is noted, the AAC must promptly clean up the dust or debris and record those actions on their daily report.
 - B. The GC, AAC, and Owner must perform a final walk-thru of the work areas to inspect for any damage that may have occurred as a result of the AAC's activities at the site.
 - C. The AAC must submit all documentation required by this section for Owner review and approval.
 - D. After the AAC has demobilized from the site and all required submittals approved, then the requirements of this section will have been satisfied.

END OF SECTION

REMOVAL AND DISPOSAL OF MISCELLANEOUS HAZARDOUS MATERIALS

PART 1 - GENERAL

1.1. NOTIFICATIONS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.2. SECTION INCLUDES

- A. This section applies to work involving the removal, disturbance, transportation, and disposal of lead-containing materials (other than those related to lead-based paint activities as defined and regulated by 40 CFR 745), mercury-containing materials, PCB-containing light ballasts and associated contamination, equipment with ozone depleting substances, items with radioactive components, and heat transfer fluids in building heating and cooling systems.
- B. This section does not apply to or address requirements related to lead-based paint activities as defined and regulated by 40 CFR 745 or any other health, safety, or environmental concerns related to other types of materials or conditions which may be present at this site; other PCB-containing materials or contamination not related to light ballasts; stored materials or other materials which are not installed building materials or components; contractor supplied or produced wastes; or any other wastes not specifically described as included.

1.3. CONTRACT DOCUMENTS AND RELATED REQUIREMENTS

- A. Drawings and general provisions of the contract, including general and supplementary conditions and other Division 0, 1, and 2 specifications, apply to the work of this section. The contract documents show or describe the work to be done under the contract including related requirements and conditions impacting the project. Related requirements and conditions include, but are not limited to, applicable codes and regulations, notices and permits, existing site conditions and restrictions on use of the site, security of the site, requirements for partial owner occupancy during the work, coordination with other work and the phasing of the work, among others. In the event the Contractor discovers a conflict in the contract documents and/or requirements, the conflict must be brought to the immediate attention of the Owner for resolution. Whenever there is a conflict or overlap in the requirements, the most stringent shall apply. Any actions taken by the Contractor without authorization from the Owner shall become the sole risk and responsibility of the Contractor. All costs incurred due to such action are also the responsibility of the Contractor.

1.4. RELATED WORK

- A. 02 26 00 – Hazardous Materials Assessment
- B. 02 82 33 – Removal and Disposal of Asbestos Containing Materials

1.5. REFERENCE STANDARDS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
- B. All work under this contract shall be done in strict accordance with all applicable federal, state, and local regulations, standards and codes governing miscellaneous hazardous materials removal work, and any other trade work done in conjunction with the project. All applicable codes, regulations, and standards are adopted into this specification and will have the same force and effect as this specification.
- C. The most recent edition of any relevant regulation, standard, document, or code shall be in effect. Where conflict among the requirements or with these specifications exists, the most stringent requirement(s) shall be utilized.
- D. All related regulations, statutes, public laws, registers, and regulatory guidance are incorporated by reference.
- E. Alaska Administrative Code (AAC)
 - 1. 8 AAC 61 Occupational Safety and Health Division
 - 2. 8 AAC 61.1010-1190 Occupational Safety and Health Standards
 - 3. 17 AAC 25 Operations, Wheeled Vehicles
 - 4. 18 AAC 60 Solid Waste Management
 - 5. 18 AAC 62 Hazardous Waste
 - 6. 18 AAC 70 Water Quality Standards
 - 7. 18 AAC 72 Wastewater Treatment and Disposal
 - 8. 18 AAC 75 Oil and Other Hazardous Substances Pollution Control
 - 9. 18 AAC 85 Radiation Protection
- F. Alaska Statutes (AS)
 - 1. AS Section 18.60 Safety
 - 2. AS Section 23.05 Department of Labor and Workforce Development
- G. American National Standards Institute (ANSI)
 - 1. ANSI Z535 Series Safety Alerting Standards
- H. American Society of Safety Professionals (ASSP)
 - 1. ASSP Z9.2 Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems
- I. ASTM International (ASTM)
 - 1. ASTM C732 Aging Effects of Artificial Weathering on Latex Sealants
 - 2. ASTM D522/D522M Mandrel Bend Test of Attached Organic Coatings
 - 3. ASTM D2794 Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
 - 4. ASTM D4397 Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
 - 5. ASTM D4801 Standard Specification for Polyethylene Sheeting in Thickness of 0.25 mm (0.010 in.) and Greater
 - 6. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
 - 7. ASTM E96/E96M Standard Test Methods for Water Vapor Transmission of Materials
 - 8. ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials

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9. ASTM E736/E736M Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
 10. ASTM F2412 Standard Test Methods for Foot Protection
 11. ASTM F2413 Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear
- J. Compressed Gas Association (CGA)
1. CGA G-7 Compressed Air for Human Respiration; 6th Edition
- K. Institute of Environmental Sciences and Technology (IEST)
1. IEST-Recommended Practices-Contaminant Control (IEST-RP-CC-xxxx) Series
- L. International Air Transport Association (IATA)
1. IATA DGR Dangerous Goods Regulations
- M. International Organization for Standardization (ISO)
1. ISO 13.340 Protective Equipment Series Standards
- N. International Safety Equipment Association (ISEA)
1. ANSI/ISEA 101 Limited-Use and Disposable Coveralls—Size and Labeling Requirements
 2. ANSI/ISEA 105 Hand Protection Classification
 3. ANSI/ISEA Z87.1 Occupational and Educational Personal Eye and Face Protection Devices
 4. ANSI/ISEA Z88 Series Respiratory Protection Standards
- O. National Fire Protection Association (NFPA)
1. NFPA 701 Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
 2. NFPA 1990 Standard for Protective Ensembles for Hazardous Materials and CBRN Operations
- P. National Institute for Occupational Safety and Health (NIOSH)
1. NIOSH NMAM NIOSH Manual of Analytical Methods
- Q. Nuclear Regulatory Commission
1. 10 CFR Chapter I Nuclear Regulatory Commission
 2. 10 CFR 20 Standards for Protecting Against Radiation
- R. Underwriters Laboratories (UL)
1. UL 586 Standard for Safety High-Efficiency Particulate, Air Filter Units
- S. United States Army Corps of Engineers (USACE)
1. Engineer Manual EM 385-1-1 Safety and Health Requirements
- T. United States Department of Transportation
1. 49 CFR Subchapter C Hazardous Materials Regulations
 2. 49 CFR 107 Hazardous Materials Program Procedures
 3. 49 CFR 171 General Information, Regulations, and Definitions
 4. 49 CFR 172 Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
 5. 49 CFR 173 Shippers - General Requirements for Shipments and Packagings
 6. 49 CFR 178 Specifications for Packagings
 7. 49 CFR 179 Specifications for Tank Cars

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- U. United States Environmental Protection Agency (EPA)
 - 1. 40 CFR 61 National Emission Standards for Hazardous Air Pollutants
 - 2. 40 CFR 82 Protection of Stratospheric Ozone
 - 3. 40 CFR 124 Procedures for Decisionmaking
 - 4. 40 CFR Subchapter I Solid Wastes
 - 5. 40 CFR 260 Hazardous Waste Management System: General
 - 6. 40 CFR 261 Identification and Listing of Hazardous Waste
 - 7. 40 CFR 262 Standards Applicable to Generators of Hazardous Waste
 - 8. 40 CFR 263 Standards Applicable to Transporters of Hazardous Waste
 - 9. 40 CFR 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
 - 10. 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
 - 11. 40 CFR 266 Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
 - 12. 40 CFR 267 Standards for Owners and Operators of Hazardous Waste Facilities Operating Under a Standardized Permit
 - 13. 40 CFR 268 Land Disposal Restrictions
 - 14. 40 CFR 270 EPA Administered Permit Programs: The Hazardous Waste Permit Program
 - 15. 40 CFR 271 Requirements for Authorization of State Hazardous Waste Programs
 - 16. 40 CFR 272 Approved State Hazardous Waste Management Programs
 - 17. 40 CFR 273 Standards for Universal Waste Management
 - 18. 40 CFR 300 National Oil and Hazardous Substances Pollution Contingency Plan
 - 19. 40 CFR 302 Designation, Reportable Quantities, and Notification
 - 20. 40 CFR 745 Lead-Based Paint Poisoning Prevention in Certain Residential Structures
 - 21. 40 CFR 761 Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions

- V. United States Military Standards
 - 1. MIL-STD-282 Filter Units, Protective Clothing, Gas-Mask Components and Related Products: Performance Test Methods

- W. United States Occupational Safety and Health Administration (OSHA)
 - 1. 29 CFR 1910.120 Appendix B General Description and Discussion of the Levels of Protection and Protective Gear.
 - 2. 29 CFR 1910 Subpart I Appendix A Nonmandatory Compliance Guidelines for Hazard Assessment and Personal Protective Equipment Selection
 - 3. 29 CFR 1910.134 Respiratory Protection
 - 4. 29 CFR 1926 Safety and Health Regulations for Construction
 - 5. 29 CFR 1926.21 Safety Training and Education
 - 6. 29 CFR 1926.28 Personal Protective Equipment
 - 7. 29 CFR 1926.32 Definitions
 - 8. 29 CFR 1926.51 Sanitation
 - 9. 29 CFR 1926.53 Ionizing Radiation
 - 10. 29 CFR 1926.55 Gases, Vapors, Fumes, Dusts, and Mists
 - 11. 29 CFR 1926.59 Hazard Communication
 - 12. 29 CFR 1926.62 Lead in Construction
 - 13. 29 CFR 1926.65 Hazardous Waste Operations and Emergency Response
 - 14. 29 CFR 1926 Subpart E (Parts 95-107) Personal Protective and Life Saving Equipment
 - 15. 29 CFR 1926.95 Criteria for Personal Protective Equipment
 - 16. 29 CFR 1926.103 Respiratory Protection
 - 17. 29 CFR 1926.200 Accident Prevention Signs and Tags
 - 18. 29 CFR 1926.1101 Asbestos

19. OSHA Publication 3071 Job Hazard Analysis

1.6. DEFINITIONS

- A. Definitions used in this section include those used in Divisions 0, 1, and 2; those defined by the Reference Standards listed above; and the following:
- B. Auxiliary Work
 - 1. Auxiliary Work is intended to include all work that is not defined as a Major Element by this section. An example of Auxiliary Work includes work such as routing of new mechanical or electrical systems within the Main Work Areas and to areas outside of the Main Work Area(s).
- C. Contractor's Professional Industrial Hygienist (CPIH)
 - 1. The Contractor's Professional Industrial Hygienist (CPIH) is responsible for all monitoring, inspections, sampling, and testing which is not work required to be performed by the IIHT. The CPIH may be hired directly by the MHRC.
- D. General Contractor (GC)
 - 1. General Contractor (GC) means the entity the Owner has entered into agreement with to serve as the overall authority of the construction-related aspects of the contract.
- E. Hazardous Materials
 - 1. As used in this section, hazardous materials means: lead-containing materials, mercury-containing materials, PCB-containing light ballasts and associated contamination, equipment with ozone depleting substances, items with radioactive components, and heat transfer fluids in building heating and cooling systems.
- F. Hazardous Materials Assessment (HMA)
 - 1. Hazardous Materials Assessment (HMA) means any reports or other existing information related to asbestos-containing materials or other potentially hazardous materials present at the site which is provided prior to the award of the contract.
- G. Main Work Area
 - 1. Main Work Area is intended to include area(s) which have defined boundaries where the majority of work is located.
- H. Major Element
 - 1. Major Element is intended to include the elements of work which are located within the Main Work Area(s), whose scope is not subject to variations in means or methods, and can generally be identified solely by graphical representation or notation on the contract drawings.
- I. Miscellaneous Hazards Removal Contractor (MHRC)
 - 1. Miscellaneous Hazards Removal Contractor (MHRC) means the GC or other subcontractor(s) responsible for conducting the work required by this section.
- J. Independent Industrial Hygiene Technician (IIHT)
 - 1. The Independent Industrial Hygiene Technician IIHT is responsible for conducting all final visual inspections and clearance monitoring required by this section. The IIHT and IIHT's employer must be completely independent of the MHRC and must have no employee or employer relationship which could constitute a conflict of interest.

- K. Refrigerant Recovery Technician (RRT)
 - 1. Refrigerant Recovery Technician (RRT) means the specialty subcontractor responsible for the removal, recovery, and recharging of ODS from equipment located onsite.

- L. Transportation and Disposal Coordinator (TDC)
 - 1. Transportation and Disposal Coordinator (TDC) means the person selected by the GC who is responsible for ensuring compliance with all applicable rules and regulations pertaining to the wastes generated by the work covered by this section.

1.7. QUALITY ASSURANCE

- A. General
 - 1. Administrative and supervisory personnel shall, at a minimum, consist of the MHRC's Competent Person, the CPIH, and the IIHT. These employees are the GC's representatives responsible for compliance with this section. Non-supervisory personnel must consist of an adequate number of qualified personnel to meet the performance requirements of the project. All personnel must meet required qualifications.
 - 2. Comply with the specific requirements of this contract, and other applicable laws, ordinances, rules, and regulations of federal, state, and local authorities having jurisdiction regarding removing, handling, storing, transporting, and disposal of the miscellaneous hazardous materials covered by this section. Notify the Owner and request resolution of conflicts between regulations and specified requirements before starting work.

- B. Responsibilities
 - 1. Owner Responsibilities Prior to Commencement of Work
 - a. The Owner will notify occupants adjacent to the work areas of project dates and requirements for relocation, if needed. Arrangements must be made prior to starting work for relocation of desks, files, equipment, and personal possessions if required to complete the work. The Owner will coordinate utilities use, locations, and other conditions of use with the GC.
 - 2. MHRC and GC Responsibility
 - a. The MHRC shall assume primary responsibility and liability for compliance with all applicable federal, state, and local regulations related to all aspects of the miscellaneous hazardous materials removal work. The GC shall assume secondary responsibility and liability for their own and their other subcontractor's compliance with all applicable federal, state, and local regulations as it relates to potential hazards associated with the miscellaneous hazardous materials present in the work areas. The MHRC and GC are responsible for providing and maintaining required documentation including, but not limited to, training, accreditations, medical exams, medical records, personal protective equipment (PPE), respiratory protection, and respirator fit testing, as required by applicable federal, state, and local regulations and this section. The MHRC and GC must hold the Owner harmless for any Contractor failure to comply with any applicable work, packaging, transporting, disposal, safety, health, or environmental regulations or contract requirements on the part of themselves, their employees, or their subcontractors.
 - 3. TDC Responsibility
 - a. The GC must designate, by position and title, one person to act as the TDC who is responsible for ensuring compliance with all applicable federal, state, and local regulations related to the transportation and disposal miscellaneous hazardous materials waste generated by the work covered by this section. The TDC's responsibilities include, but are not limited to, accurate identification and

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classification of the miscellaneous hazardous materials wastes; determination of proper shipping names; identification of marking, labeling, packaging, and placarding requirements; completion of waste profiles, hazardous waste manifests, PCB manifests, bill of ladings, exception and discrepancy reports; and all other transportation and disposal documentation required by this section.

C. Site Conditions

1. The condition of the miscellaneous hazardous materials at the site are described in the HMA, and those conditions were accurate as of the dates of inspection cited in that HMA. Prior to starting work in any area, the MHRC and GC must verify the accuracy of the conditions that are presented in the HMA, the hazards abatement design drawings and specifications, and the MHRC's approved Miscellaneous Hazards Abatement Plan (MHAP).
2. The building may be occupied and in use during the work. The MHRC and GC must coordinate the timing of work with the Owner and other trades to ensure there are no adverse effects to building functions or occupants, and that other performance requirements of the contract are met.

D. Security

1. The MHRC and GC are jointly responsible for and must control access to the areas where miscellaneous hazardous materials removal work is being performed and areas where miscellaneous hazardous materials are being stored. Access must be restricted to properly trained and protected persons authorized to be in those areas. Entry into these areas by unauthorized persons must be reported immediately to the Competent Person by anyone observing the entry. The Competent Person must immediately require any unauthorized person to leave the regulated area and then notify the Owner and the GC.

E. Variations in Quantity

1. The estimated quantities of miscellaneous hazardous materials to be removed and/or disturbed are shown on the hazards abatement drawings. Nothing in this section may be interpreted as limiting the extent of work otherwise required by this contract and related documents. Refer to the HMA for detailed information on the miscellaneous hazardous materials known or assumed to be present at this site.
2. No quantities are provided for the removal and disturbance of lead-containing materials which are incidental to the demolition work (i.e. demolition or surface preparation of walls or other components painted with lead-containing paints). Quantities are provided for metallic lead found in components which can generally be removed intact (e.g. batteries, VTR flashings, sheet lead, etc.). Metallic lead quantities do not include lead-containing solders or lead-containing sealants.
3. The estimated quantities are to be considered a baseline for bidding purposes only and are based on limited assessments of materials located within the project work areas which were made accessible to the designer for use in preparing the hazards abatement drawings and specifications. The MHRC and GC must satisfy themselves of the actual quantities to be removed and disposed of and to conduct that work in accordance with applicable laws of the authorities having jurisdiction. The MHRC and GC must document the locations and quantities of miscellaneous hazardous materials removed each day from each work area. Quantities of miscellaneous hazardous materials must match the units used on the hazards abatement drawings. Where, in the opinion of the MHRC or GC, the use of alternative units is necessary, those alternative units may be used with preapproval from the Owner. Minor variations (+/- 10 percent) in the quantities of miscellaneous hazardous materials shown on the hazards abatement drawings are considered as having no impact on contract price or the performance requirements of this contract. The MHRC and GC must submit unit pricing within their bid for each miscellaneous hazardous materials identified on the

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drawings in case additional quantities of material in excess of the minor variation stated above are required to be removed or disturbed and disposed of in order to accommodate the work. The unit prices submitted by the MHRC and GC are to be used as the cost basis for additional work required under the contract.

F. Preconstruction Conference

1. After the Preconstruction Submittals have been reviewed and approved, a preconstruction meeting must be held with the following parties in attendance at a minimum: the MHRC and their Competent Person, the GC, other interested subcontractors, the CPIH, the IIHT, and the Owner. The goals of the preconstruction meeting are to discuss the planned scope, phasing, and overall coordination and execution of the miscellaneous hazardous materials work; to verify that the approved Preconstruction Submittals are still valid; to identify any potential issues with the project scope, timing, or planning as it relates to the miscellaneous hazardous materials scope of work, and to ensure agreement among the parties prior to commencing work. The preconstruction meeting minutes and sign in sheet must be submitted to the Owner within 5 days after the completion of the preconstruction meeting.

G. Stop Work Order

1. If the Owner or representative of a regulatory authority having jurisdiction presents a verbal Stop Work Order, the MHRC and GC must immediately stop all miscellaneous hazardous materials removal work and must maintain all work area protections. If a verbal Stop Work Order is issued, the Owner or a representative of a regulatory authority having jurisdiction will follow-up with a written order to the MHRC and GC as soon as it is practicable. The MHRC and GC must not resume any miscellaneous hazardous materials removal activity until authorized to do so in writing by the Owner or a representative of a regulatory authority having jurisdiction. A Stop Work Order may be issued at any time the Owner or a representative of a regulatory authority having jurisdiction determines miscellaneous hazardous materials removal work conditions/activities are not being performed within the requirements of this specification, the MHRC's approved MHAP, regulatory requirements, or that an imminent hazard exists to human health or the environment. Work stoppage will continue until conditions have been corrected to the satisfaction of the Owner or the representative of a regulatory authority having jurisdiction. Standby time and costs for corrective actions will be borne by the MHRC or GC, including any applicable time or expense incurred by any of the personnel categories stated in the beginning of this paragraph, as a result of the Stop Work Order. The occurrence of any of the following events must be reported immediately by the MHRC's Competent Person to the Owner and GC using the most expeditious means (e.g., verbal or telephonic), followed up with written notification to the Owner as soon as practicable. The MHRC and GC must immediately stop miscellaneous hazardous materials removal removal/disturbance activities and initiate corrective actions if:
 - a. Mercury vapor concentrations exceed 600 ng/m³ outside of the regulated work area.
 - b. Breach or break in regulated area containment barrier(s).
 - c. Pressure within a Negative Pressure Enclosure is not maintained at or below - 0.02 inch WCG.
 - d. Serious injury/death at the site.
 - e. Fire/safety emergency at the site.
 - f. Respiratory protection system failure.
 - g. Power failure or loss or inadequate use of wetting agent.
 - h. Any visible emissions observed outside the regulated area.
 - i. Failure to follow project specification requirements.

- H. Protection of Existing Work to Remain
 - 1. The MHRC and GC must not damage or cause contamination to existing finishes or other existing elements or areas scheduled to remain at the site. Where such elements or areas are damaged or contaminated as verified by the Owner using visual inspection and/or sample analysis, the MHRC and GC must stop work and restore those elements or areas to their original undamaged and uncontaminated condition at no additional cost to the Owner. Once the elements or areas have been restored to the satisfaction of the Owner, the work may proceed.

- I. Monitoring, Inspections, Sampling, and Testing
 - 1. All sampling required by this section must be performed by qualified persons meeting the minimum requirements of this section.
 - 2. The CPIH is responsible for conducting all non-clearance monitoring, inspections, sampling, and testing required by this section.
 - 3. All final visual inspections and clearance air monitoring required by this section must be performed by the IIHT.
 - 4. All costs related to the monitoring, inspections, sampling, and testing required by this section are to be borne by the MHRC and/or GC.
 - 5. All costs related to additional monitoring, inspections, sampling, and testing exceeding the minimum requirements of this section, including those costs for any failed final visual inspections or clearance air monitoring, must come at no additional cost to the Owner.
 - 6. The Owner or the representative of a regulatory authority having jurisdiction may observe any monitoring, inspections, sampling, and testing performed under this contract at any time or location at their discretion.
 - 7. The Owner or the representative of a regulatory authority having jurisdiction may perform additional monitoring, inspections, sampling, and testing at any time or location at their discretion.

- J. Onsite Documentation
 - 1. The MHRC and GC must ensure employees have access to complete copies of the contract documents, the submittal items and other elements required by this section, and to all applicable standards, regulations, codes, and other documents. Electronic format is acceptable except where the contract documents, the submittal items and other elements required by this section, or applicable standards, regulations, codes, or other documents specifically require physical copies to be maintained. Access must be made available at the jobsite at no cost to the employee during normal working hours or at all times work covered by this section is being performed.

1.8. REQUIREMENTS

- A. Description of Work
 - 1. The following tables list the known and assumed miscellaneous hazardous materials at this site. The miscellaneous hazardous materials that are located within the Main Work Areas under this contract that are anticipated to be disturbed by the Major Elements of the miscellaneous hazardous materials work being performed are designated by the Disturbance Code "Y". The miscellaneous hazardous materials that may be located inside of the Main Work Areas and/or outside of the Main Work Areas that may require disturbance as necessary to accommodate the overall scope of work and related Auxiliary Work under this contract are designated by the Disturbance Code "M". All remaining miscellaneous hazardous materials are not anticipated to require disturbance to compete any element of work under this contract are designated by the Disturbance Code "N".

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LEAD		
MATERIAL DESCRIPTION	Disturbance Code	*Confirmed = C *Assumed = A *Not Present = None *Presence of material in the era is unknown = -
Lead-containing paints	Y	C
Paints classified as "lead-based" paint by the EPA	M	A
Metallic lead in solder on copper piping	Y	C
Metallic poured lead sealants in bell and spigot pipe connections	Y	A
Metallic lead in VTR flashings	N	None
Metallic lead inside of roof drain bowls at clamping rings	N	None
Metallic sheet lead	N	None
Lead-acid batteries	N	C
Glazings of ceramic/porcelain wall tiles	N	A
Glazings of ceramic/porcelain plumbing fixtures	N	A
"Formica" laminate panels on cabinetry and countertops	N	C
Plastic and vinyl products	Y	A

OTHER COMMON HAZARDOUS BUILDING MATERIALS		
MATERIAL DESCRIPTION	Disturbance Code	*Confirmed = C *Assumed = A *Not Present = None *Presence of material in the era is unknown = -
Mercury-containing lamps, fluorescent	N	None
Mercury-containing lamps, high intensity discharge	N	None
Mercury-containing lamps, neon	N	None
Mercury-containing equipment, thermostats	N	-
Mercury-containing equipment, HVAC system control switches	N	-
Poured polyurethane flooring classified as a hazardous waste for mercury	N	Removed
PCB-containing light ballasts	N	None
Contamination from leaking PCB-containing light ballasts	N	None
Any material or product which contains greater than 1 mg/Kg of total PCBs	M	-

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OTHER COMMON HAZARDOUS BUILDING MATERIALS		
MATERIAL DESCRIPTION	Disturbance Code	*Confirmed = C *Assumed = A *Not Present = None *Presence of material in the era is unknown = -
Any manufactured article, other than a PCB Container, that contains PCBs and whose surface(s) has been in direct contact with PCBs. "PCB Article" includes capacitors, transformers, electric motors, pumps, pipes and any other manufactured item: (1) which is formed to a specific shape or design during manufacture, (2) which has end use function(s) dependent in whole or in part upon its shape or design during end use, and (3) which has either no change of chemical composition during its end use or only those changes of composition which have no commercial purpose separate from that of the PCB Article	M	-
Any package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB Articles or PCB Equipment, and whose surface(s) has not been in direct contact with PCBs	N	-
Any package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs or PCB Articles and whose surface(s) has been in direct contact with PCBs	N	-
A non-liquid material containing PCBs at concentrations ≥ 50 ppm but < 500 ppm; a liquid material containing PCBs at concentrations ≥ 50 ppm but < 500 ppm or where insufficient liquid material is available for analysis, a non-porous surface having a surface concentration $> 10 \mu\text{g}/100 \text{ cm}^2$ but $< 100 \mu\text{g}/100 \text{ cm}^2$, measured by a standard wipe test as defined in § 761.123.	M	-
Any electrical equipment including, but not limited to, transformers (including those used in railway locomotives and self-propelled cars), capacitors, circuit breakers, reclosers, voltage regulators, switches (including sectionalizers and motor starters), electromagnets, and cable, that contains PCBs at concentrations of ≥ 50 ppm and < 500 ppm in the contaminating fluid. In the absence of liquids, electrical equipment is PCB-Contaminated if it has PCBs at $> 10 \mu\text{g}/100 \text{ cm}^2$ and $< 100 \mu\text{g}/100 \text{ cm}^2$ as measured by a standard wipe test (as defined in § 761.123) of a non-porous surface	N	-
Any manufactured item, other than a PCB Container or a PCB Article Container, which contains a PCB Article or other PCB Equipment, and includes microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures	M	-

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OTHER COMMON HAZARDOUS BUILDING MATERIALS		
MATERIAL DESCRIPTION	Disturbance Code	*Confirmed = C *Assumed = A *Not Present = None *Presence of material in the era is unknown = -
PCB waste that is generated by residents on the premises of a temporary or permanent residence for individuals (including individually owned or rented units of a multi-unit construction), and that is composed primarily of materials found in wastes generated by consumers in their homes. PCB household waste includes unwanted or discarded non-commercial vehicles (prior to shredding), household items, and appliances or appliance parts and wastes generated on the premises of a residence for individuals as a result of routine household maintenance by or on behalf of the resident. Bulk or commingled liquid PCB wastes at concentrations of ≥ 50 ppm, demolition and renovation wastes, and industrial or heavy duty equipment with PCBs are not household wastes	N	-
Any PCB Article, PCB Article Container, PCB Container, PCB Equipment, or anything that deliberately or unintentionally contains or has as a part of it any PCB or PCBs	M	-
PCBs regulated for disposal under subpart D of 40 CFR 761 that also contain source, special nuclear, or byproduct material subject to regulation under the Atomic Energy Act of 1954, as amended, or naturally-occurring or accelerator-produced radioactive material	N	-
Waste containing PCBs as a result of a spill, release, or other unauthorized disposal, at the following concentrations: Materials disposed of prior to April 18, 1978, that are currently at concentrations ≥ 50 ppm PCBs, regardless of the concentration of the original spill; materials which are currently at any volume or concentration where the original source was ≥ 500 ppm PCBs beginning on April 18, 1978, or ≥ 50 ppm PCBs beginning on July 2, 1979; and materials which are currently at any concentration if the PCBs are spilled or released from a source not authorized for use under this part. PCB remediation waste means soil, rags, and other debris generated as a result of any PCB spill cleanup, including, but not limited to: (1) Environmental media containing PCBs, such as soil and gravel; dredged materials, such as sediments, settled sediment fines, and aqueous decantate from sediment. (2) Sewage sludge containing < 50 ppm PCBs and not in use according to § 761.20(a)(4); PCB sewage sludge; commercial or industrial sludge contaminated as the result of a spill of PCBs including sludges located in or removed from any pollution control device; aqueous decantate from an industrial sludge. (3) Buildings and other man-made structures (such as concrete floors, wood floors, or walls contaminated from a leaking PCB or PCB-Contaminated Transformer), porous surfaces, and non-porous surfaces	N	-

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OTHER COMMON HAZARDOUS BUILDING MATERIALS		
MATERIAL DESCRIPTION	Disturbance Code	*Confirmed = C *Assumed = A *Not Present = None *Presence of material in the era is unknown = -
Domestic septage as defined in 40 CFR 503.9 inside of the septic tanks	N	-
All electrical transformers at the building, including those in loose electrical equipment, with less than 3 pounds of fluid, circuit breakers, reclosers, oil-filled cable, and rectifiers	N	-
All electrical equipment at the building that has capacitors of any size or age, including those in loose electrical equipment	M	-
PCB-containing equipment	N	-
Ozone Depleting Substances (ODS), consumer-grade refrigerators	N	C
Ozone Depleting Substances (ODS), consumer-grade freezers	N	C
Ozone Depleting Substances (ODS), consumer-grade air conditioning equipment	N	A
Ozone Depleting Substances (ODS), commercial-grade refrigerators	N	C
Ozone Depleting Substances (ODS), commercial-grade freezers	N	C
Ozone Depleting Substances (ODS), commercial-grade air conditioning systems	N	A
Ozone Depleting Substances (ODS), drinking fountains	N	A
Ozone Depleting Substances (ODS), Halons	N	-
Ozone Depleting Substances (ODS), Other	N	A
Radioactive materials in self-illuminating exit signs	N	C
Radioactive materials in smoke detectors	N	A
Heat transfer fluids, glycol-based	N	C
Heat transfer fluids, water-based	N	None
Heat transfer fluids, unknown system contents	N	C

2. The work includes all related submittals, monitoring, inspections, sampling, testing, removal, disturbance, transportation, disposal, recordkeeping, documentation, and other elements as specified herein.

1.9. LISTING OF REQUIRED SUBMITTALS

- A. Preconstruction Submittals
 1. Miscellaneous Hazard Abatement Plan (MHAP).
 2. Employee training documentation.
 3. Competent Person documentation.
 4. Affidavit of Medical Surveillance, Respiratory Protection, and Training Accreditation.
 5. License and insurance for the MHRC.
 6. CPIH and IIHT documentation.
 7. Testing laboratory documentation.
 8. Documentation of notifications.

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9. TDC documentation.
 10. Waste transporter documentation.
 11. Waste disposal site documentation.
 12. Preconstruction meeting minutes and sign in sheet (to be submitted after initial approval of preconstruction submittals but prior to the start of work).
 13. Pre-work activities (to be submitted after initial approval of preconstruction submittals but prior to the start of work).
- B. Periodic Submittals
1. Sampling results.
 2. Project logs.
 3. Sampling and analysis plan.
 4. Updates to any of the preconstruction submittals.
- C. Closeout Submittals
1. Completed disposal records.
 2. Updates to any previously submitted submittals.

1.10. DETAILS OF REQUIRED PRECONSTRUCTION SUBMITTALS

- A. Miscellaneous Hazard Abatement Plan (MHAP)
1. The Miscellaneous Hazard Abatement Plan (MHAP) must not be combined with other hazard abatement plans and must be prepared and signed by the MHRC and/or GC and their Competent Person. Provide shop drawings for each affected area and a table of contents for each submittal item, which follows the sequence of requirements in the contract. The plan, at a minimum, must include the proposed means, methods, materials, equipment, and other procedures to be used by the MHRC which must include, but not be limited to, the following elements for each of the miscellaneous hazardous material to be removed:
 - a. Procedures for notification of other employers and their employees performing work at the site under this contract, building occupants, and other interested parties or as directed by the Owner.
 - b. A description of each miscellaneous hazardous material to be removed.
 - c. Estimated quantities of each miscellaneous hazardous material to be removed.
 - d. A pre-work sampling plan describing the procedures to be used to identify, sample, and quantify any additional miscellaneous hazardous materials found that will require disturbance.
 - e. Procedures used to identify, execute, and document potential pre-cleaning activities.
 - f. Procedures to ensure the protection of existing work to remain.
 - g. Isolation and protection of existing systems.
 - h. A detailed plan of the safety precautions such as lockout, tagout, tryout, fall protection, and confined space entry procedures and equipment and work procedures to be used during the removal, disturbance, or demolition of each miscellaneous hazardous material to be removed.
 - i. Work area setup to be used for each type of miscellaneous hazardous material to be removed.
 - j. A description of the minimum training requirements for employees for each type of miscellaneous hazardous material to be removed.
 - k. Personal protective equipment to be used for each type of miscellaneous hazardous material to be removed.
 - l. Procedures for the decontamination of personnel for each type of miscellaneous hazardous material to be removed.
 - m. Removal procedures for each type of miscellaneous hazardous material to be removed.

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- n. Procedures to be used for the decontamination of existing building components for each type of miscellaneous hazardous material to be removed.
 - o. Expendable materials to be used during the removal of miscellaneous hazardous materials for each type of miscellaneous hazardous material to be removed.
 - p. Procedures to be used in the event miscellaneous hazardous materials are spilled, leaked, damaged, or otherwise released in a manner resulting in contamination of existing building components.
 - q. Procedures to ensure negative air pressure is maintained within Negative Pressure Enclosures and corrective actions to be taken in the event of equipment failure or other events which may lead to inadequate negative pressure.
 - r. Procedures for supplying, controlling, treating, and discharging water and wastewater.
 - s. Monitoring and sampling to be used for each type of miscellaneous hazardous material to be removed.
 - t. Waste packaging, storage, loadout, decontamination, manifesting, transport, and disposal procedures.
 - u. Procedures to follow in the event additional quantities of miscellaneous hazardous materials are encountered after the start of work.
 - v. Current copies of accreditations relevant to the miscellaneous hazardous materials being removed of the person who prepared the MHRP and their Competent Person.
2. At a minimum, shop drawings must show the following elements:
- a. The locations and extents of each regulated work area.
 - b. Locations of critical barriers.
 - c. Locations of existing systems within and/or adjacent to the regulated work area boundaries to be isolated during the miscellaneous hazardous materials removal activities.
 - d. Location of decontamination area(s).
 - e. Location(s) of negative pressure exhaust routing.
 - f. Location of make-up air entrance(s) into each regulated work area.
 - g. Locations of water supplies and wastewater treatment and discharge area(s).
 - h. Locations of monitoring and sampling equipment.
 - i. Location(s) of first aid materials.
 - j. Location(s) of fire extinguishers.
 - k. Emergency egress routes.
 - l. Waste loadout route(s).
 - m. Location of temporary storage area(s).
 - n. The location of copies of all applicable codes, standards, regulations, notices, SDSs, air monitoring results, the MHRC's and/or GC's approved work plan, and other pertinent documents.
3. Shop drawings are required only if:
- a. Poured polyurethane gym flooring classified as a hazardous waste for mercury is being removed.
 - b. The miscellaneous hazardous materials being removed are required to be performed within a regulated area.
 - c. Monitoring and sampling is required due to the type of miscellaneous hazardous material being removed.
- B. Employee Training
1. All persons involved in the removal of the following miscellaneous hazardous materials must have received training required by 29 CFR 1926.21; 29 CFR 1926.62; 8 AAC 61; 40 CFR 273.16; and any other state or local regulations applicable to the specific miscellaneous hazardous material:
- a. Removal of intact universal waste mercury-containing lamps, mercury-containing thermostats, or mercury-containing equipment.

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- b. Removal of intact universal waste batteries.
 - c. Removal of intact PCB-containing light ballasts.
 - d. Removal of heat transfer fluids other than those classified as a hazardous waste.
 - e. Removal of intact components with radioactive materials.
 - f. Removal of intact equipment containing ozone depleting substances.
 - g. Removal of lead-containing materials other than those classified as a hazardous waste.
2. In addition to the training required above, all persons involved in the removal and/or cleanup of the following miscellaneous hazardous materials must have received training equivalent to the training in 29 CFR 1926.65(e):
 - a. Poured polyurethane gym flooring classified as a hazardous waste for mercury.
 - b. Non-intact mercury-containing lamps, mercury-containing thermostats, or mercury-containing equipment.
 - c. Non-intact universal waste batteries.
 - d. Heat transfer fluids classified as a hazardous waste.
 - e. Non-intact PCB-containing light ballasts.
 - f. Removal of lead-containing materials classified as a hazardous waste.
 3. All persons involved in the removal of non-intact components with radioactive materials or cleanup and removal of components contaminated by radioactive materials must have received training equivalent to the training in 10 CFR 20; 29 CFR 1926.53; and any other applicable state or local regulations.
 4. All persons involved in the recovery of ozone depleting substances from equipment must have received training required by 40 CFR 82.161 and any other applicable state or local regulations.
 5. All persons who perform the functions of a Hazmat Employee as defined by 49 CFR 171.8 must be trained in accordance with 49 CFR 172 Subpart H.
 6. Submit proof of current accreditation for persons who received training required by this section. Organize certificates by individual worker, not grouped by type of certification.
 7. Additional training related to health, safety, and environmental issues may be required, and it is the responsibility of the MHRC, the MHRC's Competent Person, the GC, and the CPIH to identify those additional issues and to recommend training as necessary to ensure compliance with applicable regulations.
- C. Competent Person
1. All miscellaneous hazardous materials removal work must be performed under the supervision of a Competent Person as defined by 29 CFR 1926.32 and 29 CFR 1926.62 and who additionally meets the employee training requirements of this section.
 2. Certify in writing that the proposed Competent Person meets the minimum requirements of this section and submit evidence to support such certification. Examples of acceptable documentation include, but are not limited to, resumes, training documentation, or descriptions of prior experience supervising or performing miscellaneous hazardous materials removal work.
- D. Affidavit of Medical Surveillance, Respiratory Protection, and Training Accreditation
1. Provide a written statement certifying that the following records are current and available on request for all persons engaged in miscellaneous hazardous materials work:
 - a. Evidence of training on the contents of 29 CFR 1926.21; 29 CFR 1926.62; 8 AAC 61, and other related training required by this section and federal, state, or local agencies.
 - b. Evidence of training on the contents of the MHRC's written Respiratory Protection Program and the requirements of 29 CFR 1910.134 and its appendices.

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- c. Documentation of medical evaluations and determinations, respirator fit tests, and associated recordkeeping required by 29 CFR 1926.103, 29 CFR 1926.62, and other regulations required by this section and federal, state, or local agencies.
- E. MHRC License and Insurance
1. Submit a copy of the MHRC's license issued by the State of Alaska and a copy of their insurance policy, including exclusions, with a letter from their agent stating in plain language the coverage provided and the fact that miscellaneous hazardous materials removal activities are covered by the policy.
- F. Contractor's Professional Industrial Hygienist (CPIH) ; Independent Industrial Hygiene Technician (IIHT)
1. Submit the following information for the Contractor's Professional Industrial Hygienist (CPIH):
 - a. The name, address, and telephone number of the CPIH.
 - b. Evidence that the CPIH meets the employee training requirements of this section for each miscellaneous hazardous material affected by the project.
 2. Submit the following information for the Independent Industrial Hygiene Technician (IIHT):
 - a. The name, address, and telephone number of the IIHT.
 - b. Evidence that the IIHT meets the employee training requirements of this section for each miscellaneous hazardous material affected by the project.
 - c. A written statement certifying that the IIHT and IIHT's employer are completely independent of the MHRC and have no employee or employer relationship which could constitute a conflict of interest.
- G. Testing Laboratory
1. The minimum analytical capabilities required for the miscellaneous hazardous materials work under this contract include:
 - a. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 1110A – Corrosivity towards steel.
 - b. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 1311 – Toxicity Characteristic Leaching Procedure.
 - c. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 6010D – Inductively Coupled Plasma-Atomic Emission Spectrometry.
 - d. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 6020B – Inductively Coupled Plasma-Mass Spectrometry.
 - e. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 7000B – Flame Atomic Absorption Spectrophotometry.
 - f. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 7010 – Graphite Furnace Atomic Absorption Spectrophotometry.
 - g. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 7040A – Mercury in Liquid Waste (Manual Cold-Vapor Technique).
 - h. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 7471B – Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique).
 - i. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 9040C – pH Electrometric Measurement.
 - j. NIOSH NMAM 5503 – Polychlorobiphenyls.

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- k. NIOSH NMAM Method 6009 – Mercury, modified to achieve a limit of quantification less than 60 ng/m³.
2. Submit the following information for each testing laboratory:
 - a. The name, address, and telephone number of the testing laboratory.
 - b. The testing laboratory's current American Industrial Hygiene Association Laboratory Accreditation Programs (AIHA LAP) certificate of accreditation; scope of accreditation; and the most recent Proficiency Testing Performance Report for the Industrial Hygiene Proficiency Analytical Testing (IHPAT) program showing the testing laboratory as "Proficient" for the "Metals Analyte Class" in the "Overall Performance Summary".
 - c. For laboratories performing TCLP using Method 1311, submit current copies of their certificate of accreditation issued by an accrediting body listed on the National Environmental Laboratory Accreditation Management System maintained by the National Environmental Laboratory Accreditation Program (NELAP).
 - d. The testing laboratory's current American Industrial Hygiene Association Laboratory Accreditation Programs (AIHA LAP) certificate of accreditation; scope of accreditation; and the most recent Proficiency Testing Performance Report for the Environmental Lead Proficiency Analytical Testing (ELPAT) program showing the testing laboratory as "Proficient" for the "Paint Analyte Class", "Soil Analyte Class", and "Dust Analyte Class" in the "Overall Performance Summary".
 - e. The testing laboratory must be independent of the MHRC and GC and must have no employee or employer relationship which could constitute a conflict of interest.
- H. Notifications
 1. Submit the EPA identification number for the site. If the site was not already assigned an EPA identification number, the TDC must assist the Owner in obtaining an EPA identification number for the site under the following conditions:
 - a. If the work covered by this section will by itself generate hazardous wastes in excess of the those allowed for a very small quantity generator as defined by 40 CFR 260.10.
 - b. If other hazardous wastes are being generated at the site, and the work covered by this section will generate additional hazardous wastes which when added together is in excess of the those allowed for a very small quantity generator as defined by 40 CFR 260.10.
 - c. If the work covered by this section cannot be performed in accordance with the conditions for exemption for a very small quantity generator defined in 40 CFR 262.14.
 - d. If using the alternative standards for episodic generation found in 40 CFR 262 Subpart L.
 - e. If the work covered by this section will by itself generate universal wastes in excess of the those allowed for a small quantity handler of universal waste as defined by 40 CFR 273.9.
 - f. If other universal wastes are being generated at the site, and the work covered by this section will generate additional universal wastes which when added together is in excess of the those allowed for a small quantity handler of universal waste as defined by 40 CFR 273.9.
 - g. If otherwise required by 40 CFR Subchapter I.
 2. Submit copies of notifications to the regional EPA authority:
 - a. As required by 40 CFR 262.232 for episodic generation as defined by 40 CFR 262.231.
 - b. As required by 40 CFR 273.32 for large quantity handlers of universal waste as defined by 40 CFR 273.9.
 - c. If otherwise required by 40 CFR Subchapter I.

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3. If wastes will cross international boundaries, submit notifications as required by 40 CFR 262 Subpart H and any additional notifications required by the country through which the wastes will be transported.
- I. TDC Documentation
1. Certify in writing that the proposed TDC meets the minimum requirements of this section and submit evidence to support such certification. Examples of acceptable documentation include, but are not limited to, resumes, training documentation, or descriptions of prior experience supervising or performing miscellaneous hazardous materials removal work.
 2. Submit evidence that the TDC meets the employee training requirements of this section for each miscellaneous hazardous material affected by the project.
- J. Waste Transporter
1. Submit the EPA identification number for each transporter who will transport wastes generated by the work covered by this section which are classified as:
 - a. Hazardous wastes, hazardous materials, or hazardous substances as defined by 40 CFR 261.3 and 49 CFR 171.8.
 - b. PCB wastes as defined by 40 CFR 761.3.
 2. Submit written evidence that the transporter is approved to transport universal wastes in accordance with the requirements of 40 CFR 263 Subpart D.
 3. Submit written evidence that each transporter who transports hazardous wastes, hazardous materials, or hazardous substances as defined by 40 CFR 261.3 and 49 CFR 171.8 is registered in accordance with 49 CFR 107 Subpart G, if required by 49 CFR 107.601.
 4. Submit written evidence that each transporter who transports hazardous wastes, hazardous materials, or hazardous substances as defined by 40 CFR 261.3 and 49 CFR 171.8 has received training in accordance with 49 CFR 172 Subpart H.
- K. Waste Disposal Site
1. Submit the following for each facility which will receive, handle, treat, store, accumulate, dispose of, recycle, or reclaim any of the miscellaneous hazardous wastes generated by the work covered by this section:
 - a. The name, address, and telephone number of the facility.
 - b. The EPA identification number.
 2. Submit the following for each facility which will receive, handle, treat, store, accumulate, dispose of, recycle, or reclaim universal wastes generated by the work covered by this section:
 - a. Certification of the facility's universal waste handler status as a small quantity handler of universal waste, a large quantity handler of universal waste, or a destination facility as defined by 40 CFR 273.9.
 3. Submit the following for each facility which will receive, handle, treat, store, accumulate, dispose of, recycle, or reclaim miscellaneous hazardous wastes generated by the work covered by this section which meet the definition of hazardous wastes, hazardous materials, or hazardous substances as defined by 40 CFR 261.3 and 49 CFR 171.8; universal wastes as defined by 40 CFR 273.9; and PCB wastes as defined by 40 CFR 761.3:
 - a. Evidence the facility is permitted to receive and manage the types of wastes being disposed of in accordance with 40 CFR 124, 40 CFR 270, and RCRA Subtitle C.
 - b. For PCB wastes, evidence the facility is approved to receive and manage PCB wastes in accordance with TSCA and 40 CFR 761.
 - c. Written approval from the facility stating that they will accept the types of wastes being transported to their facility.

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4. Submit evidence that each facility which will handle, treat, store, accumulate, dispose of, recycle, or reclaim equipment with radioactive components being disposed of as part of the work covered by this section:
 - a. Is a specific licensee authorized by the NRC to accept such wastes in accordance with 10 CFR Chapter I and their Radioactive Materials License number.

1.11. DETAILS OF REQUIRED PERIODIC SUBMITTALS

A. Sampling Results.

1. Submit the following information for all sampling events, regardless of the type of sampling:
 - a. The printed name and signature of the individual who conducted the sampling and their certification names, numbers, and expiration date relevant to the type of sampling performed.
 - b. The date the samples were collected.
 - c. The requested analytical method.
 - d. The sample prefixes, numbers, descriptions, and other unique identifying information.
 - e. Field logs associated with the sampling.
 - f. Drawings showing the locations of all sampling locations.
 - g. Chain of custody documentation for the samples.
 - h. A finalized report from the testing laboratory showing the name and location of the testing laboratory, the dates of analysis, the name of the analysts, the analytical method used, and the results of the analysis for all samples. The finalized report must be signed by the analyst.
2. Submit the following additional information for all air sampling events, regardless of the type of sampling:
 - a. Purpose/type of air sample (e.g. personnel, inside or outside work area, baseline, clearance, etc.).
 - b. For personnel monitoring, the name of the person being monitored, their work activities, and the type of PPE being worn.
 - c. The type of sampling cassette or media used.
 - d. The locations of samples and activities being performed during the sampling period.
 - e. Sampling pump manufacturer, model number, and serial number.
 - f. Beginning flow rate, end flow rate, and average flow rate (L/min).
 - g. Equipment and equipment identifier (serial number, etc.) used to calibrate flow rates.
 - h. Sample period start time, stop time, and elapsed time (in minutes).
 - i. Total air volume sampled (liters).
3. Submit the following additional information for all wipe sampling events, regardless of the type of sampling:
 - a. Purpose/type of wipe sample (e.g. inside or outside work area, baseline, clearance, etc.).
 - b. The type of sampling wipes, templates, sample containers, or other media used.
 - c. Lot number and expiration date of wipes used.
 - d. The total area sampled in square feet, square centimeter, or other unit which is capable of being converted to square feet or square centimeter.
4. Submit the following additional information for all personnel monitoring events:
 - a. Purpose of monitoring personnel.
 - b. Types of PPE being worn by personnel.
 - c. If personnel monitoring was performed as part of an exposure assessment, submit the written results of the assessment.
5. Submit the following additional information for all clearance monitoring events:

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- a. Signed and completed final visual inspection forms.
 6. Submit the following additional information for clearance monitoring events conducted after the complete removal of poured polyurethane gym flooring classified as a hazardous waste for mercury:
 - a. Temperature and relative humidity logs collected during the sampling period.
 7. Documentation for all sampling events must be submitted to the Owner within 24 hours of receiving the finalized laboratory results.
- B. Work area inspections and clearances.
1. Documentation of final visual inspections must:
 - a. Include the time and date of the inspection.
 - b. The name and signature of the IIHT conducting the inspection.
 - c. The IIHT's client which authorized the inspection.
 - d. The name of the GC, the MHRC, and the MHRC's Competent Person.
 - e. A written description of the location the inspection is being performed.
 - f. A sketch or drawing of the location the inspection is being performed.
 - g. Indicate whether the work area was satisfactorily cleaned or indicate that the work area was not satisfactorily cleaned.
 - h. If the work area was satisfactorily cleaned, include a statement that the work area is ready for clearance air monitoring.
 - i. If the work area was not satisfactorily cleaned, indicate the deficiencies noted and the recommended corrective actions to be taken.
 - j. Be uniquely labeled or titled so that it can be referenced by other documentation.
 2. Clearance monitoring documentation must:
 - a. Indicate the unique label or title of the satisfactory final visual inspection for the work area.
 - b. Include all other sampling documentation required by this section.
 3. Documentation for all work area inspections and clearance events must be submitted to the Owner within 24 hours of receiving the finalized laboratory results.
- C. Project Logs.
1. Submit all project logs no later than 24 hours after the end of shift.
 2. The MHRC's written daily log must include:
 - a. The date and time the work took place.
 - b. The name and signature of the Competent Person.
 - c. The name of the CPIH and a description of the type(s) of sampling and inspections performed by the CPIH.
 - d. A description of the work being performed.
 - e. A sketch or drawing showing the location of the work being performed.
 - f. The types and quantities of miscellaneous hazardous materials removed.
 3. Regulated area sign-in sheets must include:
 - a. The date and time the work took place.
 - b. The name and signature of the Competent Person.
 - c. A description of where the work is being performed, and if more than one regulated area is present, which regulated area the sign-in sheet applies to.
 - d. The name and signature of each person entering and exiting the regulated work area.
 4. Pressure differential recordings for Negative Pressure Enclosures.
- D. Sampling and analysis plan.
1. A sampling and analysis plan in accordance with EPA recommendations and industry standards. The sampling and analysis plan must include the following general elements:
 - a. The location of the sampling activities.
 - b. Existing waste characterization data for the materials to be sampled, if any.

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- c. Sampling rationale and objectives.
- d. The material to be sampled and constituents of concern.
- e. Sample selection and collection procedures.
- f. Sample documentation and shipment.
- g. Analytical methods to be used and each method's limits of detection, limits of quantification, and reporting units.
- h. The selected analytical laboratory.

E. Submit updates to the preconstruction submittals generated during the work.

1.12. DETAILS OF REQUIRED CLOSEOUT SUBMITTALS

A. Completed disposal records:

- 1. The transportation and disposal of any materials classified as a hazardous waste by 40 CFR 261.3 must be documented using EPA Form 8700-22 "Uniform Hazardous Waste Manifest" (including, if necessary, EPA Form 8700-22A), or electronic manifest.
- 2. The transportation and disposal of any materials classified as a PCB waste by 40 CFR 761.3 must be documented using EPA Form 8700-22 "Uniform Hazardous Waste Manifest" (including, if necessary, EPA Form 8700-22A), or electronic manifest, a certificate of disposal in accordance with 40 CFR 761.218, and any additional information if required by 40 CFR 761 Subpart K.
- 3. If wastes crossed international boundaries, submit additional waste transport and disposal documentation as required by 40 CFR 262 Subpart H and as required by the country through which the wastes were transported.
- 4. Documentation for the disposal of each type of universal waste must include the following:
 - a. The generator name, address, and phone number.
 - b. The transporter name, address, and phone number.
 - c. The name, address, and phone number of the universal waste transfer facility and/or universal waste handler.
 - d. The name, address, and phone number of the destination facility.
 - e. The EPA identification number for each generator, handler, transporter, and destination facility.
 - f. The type of universal waste.
 - g. The date the universal wastes were first removed.
 - h. The quantity of universal waste.
 - i. The date the universal wastes were transferred to another universal waste handler, transporter, transfer facility, or destination facility.
- 5. Documentation for the recycling of heat transfer fluids other than those classified as a hazardous waste must include the following:
 - a. The name, address, and phone number of the site where the heat transfer fluids were removed.
 - b. The transporter name, address, and phone number.
 - c. The name, address, and phone number of the transfer facility and/or recycling facility.
 - d. The type of heat transfer fluids.
 - e. The date the heat transfer fluids were first removed.
 - f. The quantity of heat transfer fluids.
 - g. The date the heat transfer fluids were transferred to another transporter, transfer facility, or final recycling facility.
- 6. Documentation for the disposal of items with radioactive components waste must include the following:
 - a. The name, address, and phone number of the site where the items with radioactive components were removed.
 - b. The transporter name, address, and phone number.

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- c. The name, address, and phone number of the final destination facility.
 - d. The manufacturer name, model number, serial number, manufacture date, life rating, and date of removal for each item with radioactive components.
 - e. Copies of notifications to the NRC and State Director.
 - 7. Documentation for the disposal of ozone depleting substances must include the following:
 - a. The name, address, and phone number of the site where the ozone depleting substances were removed.
 - b. The transporter name, address, and phone number.
 - c. The name, address, and phone number of the transfer facility and/or final recycling or destruction facility.
 - d. The types of ozone depleting substances removed, to include information on any other substances or contaminants which were present in the ODS that would affect how the ODS is regulated, such as those described in 40 CFR 82 Subpart F Appendix A.
 - e. The date the ozone depleting substances were first removed.
 - f. The quantity of ozone depleting substances.
 - g. The date the ozone depleting substances were transferred to another transporter, transfer facility, and/or final recycling or destruction facility.
 - 8. Documentation for the recycling of metallic lead materials must include the following:
 - a. The name, address, and phone number of the site where the metallic lead materials were removed.
 - b. The transporter name, address, and phone number.
 - c. The name, address, and phone number of the transfer facility and/or recycling facility.
 - d. The type of metallic lead materials.
 - e. The date the metallic lead materials were first removed.
 - f. The quantity of metallic lead materials.
 - g. The date the metallic lead materials were transferred to another transporter, transfer facility, or final recycling facility.
 - 9. If more than one form is used to document the transportation and disposal of any miscellaneous hazardous material, each form must contain a unique identifying number, page number, and total page count.
- B. In addition to these submittals, the closeout submittals must include all updates to previously submitted information as necessary to ensure the documentation requirements of this section are fulfilled.

1.13. PERFORMANCE REQUIREMENTS FOR SUBMITTALS

- A. All types of submittals must be submitted as a "submittal package" with all required documentation for the type of submittal, must be reasonably organized, and must not contain duplicate information or other information not required by this section. Piecemeal submittals, incomplete submittals, disorganized submittals, or submittals containing duplicative or unnecessary information will be rejected without review and returned to the MHRC for revision.
- B. The MHRC must provide the initial Preconstruction Submittal package required by this section to the Owner no less than 14 days prior to the planned start of work.
- C. Periodic Submittals must be provided to the Owner within the timeframes specified for each submittal item. Where no timeframe is provided, the Periodic Submittals must be provided at least weekly.

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- D. The MHRC must provide the initial Closeout Submittal package required by this section to the Owner no later than 14 days after demobilization from the site by the MHRC.
- E. The performance requirements for submittals apply to each construction season and phase separately.
- F. The Owner will provide written acceptance or rejection of all submittals no later than 10 days after receiving the submittals.
- G. Failure to deliver submittals in accordance with these performance requirements and/or failure to submit any documentation required by this section may result in the withholding of payment until such time a resolution has been reached to the satisfaction of the Owner.

PART 2 - PRODUCTS

2.1. GENERAL

- A. The MHRC and GC must provide and maintain a sufficient quantity of materials and equipment required to complete the work of the project. This may include, but is not limited to, HEPA vacuums, scrapers, sprayers, nylon brushes, brooms, disposable mops, rags, sponges, staple guns, shovels, ladders and scaffolding of suitable height and length, fall protection devices, water hoses, airless spray equipment, and any other tools, materials or equipment required to conduct the miscellaneous hazardous materials removal work.
- B. All products used during the work must be used in strict accordance with the manufacturer's instructions.
- C. Store all materials subject to damage off the ground, away from wet or damp surfaces and under cover sufficient enough to prevent damage or contamination.
- D. Flammable and combustible materials must not be stored inside of any structure, and if stored elsewhere onsite, must be stored in a container specifically designed for the storage of such materials.
- E. Provide Ground-Fault Circuit Interrupters (GFCI) for all electrical equipment.
- F. All electrical-related work must be performed by a licensed electrician.

2.2. BACKUP ELECTRICAL SOURCES

- A. Provide at least one backup electrical source, such as a standby or backup generator, independent of the building's electrical systems and any other primary electrical systems established by the GC, which has sufficient capacity and rating to supply the maximum expected electrical demand of all electrical devices required to run continuously during the abatement work, including, but not limited to negative air machines, pressure differential monitoring devices, and other critical systems.

2.3. CHEMICALS

- A. Maintain Safety Data Sheets (SDS) at the jobsite for all hazardous chemicals under OSHA 29 CFR 1926.59 - Hazard Communication and 8 AAC 61.1110 - Additional Hazard Communication Standards.

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- B. Solvent must be compatible with replacement materials, must be nonflammable, and must not contain methylene chloride, glycol ether, or halogenated hydrocarbons. Solvents used onsite must have a flash point greater than 140 degrees F.
- C. Chlorinated compounds shall not be used with any product.
- D. Chemical paint strippers must be bio-degradable, capable of removing existing paint layers in one application, be formulated to prevent stain, discoloration, or raising of the substrate materials, and must be acceptable to the Owner.
- E. Neutralizers for paint strippers must be compatible with the substrate and suitable for use with the chemical stripper that has been applied to the surface.

2.4. DANGER SIGNS AND TAPE

- A. Use danger signs and tape which comply with 29 CFR 1926.62(m), 29 CFR 1926.200, and ANSI Z535 series standards.

2.5. DUCT TAPE

- A. Use commercial grade duct tape which is compatible with existing substrates and materials being used; capable of withstanding the forces encountered during the work, such as for air movement, the weight of water, equipment, personnel, and materials, from punctures, and other expected forces; and that is capable of maintaining bonding strength in wet or dry conditions throughout the temperature extremes expected to be encountered during the work.

2.6. GLOVEBAGS AND GLOVEBOXES

- A. All glovebags must meet or exceed the following minimum specifications:
 1. Must not be larger than 60" x 60".
 2. Must have glove-like appendages through which materials and tools may be handled.
 3. Must be a minimum of 6-mil thick.
 4. Must be seamless at the bottom.
 5. Must be used without modification.
- B. All gloveboxes must meet or exceed the following minimum specifications:
 1. Must have rigid sides and made from metal or other material which can withstand the weight of the materials, tools, and water used during removal.
 2. Must use a minimum of 6-mil thick polyethylene sheeting.
 3. Must have a negative pressure generator capable of maintaining negative pressure in the system.
 4. Must have an air filtration unit attached to the glovebox.
 5. Must be fitted with gloved apertures.
 6. Must have an aperture at the base of the box of adequate size to serve as a bagging outlet for wastes and water.

2.7. HEPA FILTERS

- A. Use only HEPA filters certified as capable of capturing particulates of 0.3 microns with 99.97% efficiency when tested in accordance with UL 586, IEST-RP-CC series, or MIL-STD-282. HEPA filters must be labeled with the certifying organization.

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- B. All equipment using HEPA filters must be designed so that all the air drawn into the equipment is expelled through one or more HEPA filters with none of the air leaking past any portion of the equipment prior to passing through the HEPA filters.

2.8. LABELS

- A. Provide labels for each miscellaneous hazardous material waste covered by this section which conform to the requirements of 40 CFR 262.31; 49 CFR 172 Subpart E, and ANSI Z535 series standards.

2.9. LOCAL EXHAUST VENTILATION

- A. Use HEPA-filtered local exhaust ventilation meeting or exceeding the performance requirements of ASSP Z9.2.
- B. In addition to the above specifications, local exhaust ventilation used for any work involving mercury dust or vapor must be designed specifically for that purpose, have an activated charcoal filter, and at least one HEPA or ULPA filtration stage.

2.10. MARKINGS

- A. Provide markings for each miscellaneous hazardous material waste covered by this section which conform to the requirements of 40 CFR 262.32 and 49 CFR 172 Subpart D.

2.11. NEGATIVE AIR MACHINES

- A. Use HEPA-filtered negative air machines which are capable of meeting or exceeding the performance requirements for Negative Pressure Enclosure in 29 CFR 1926.1101(g)(5)(i).
- B. In addition to the above specifications, negative air machines used for any work involving mercury dust or vapor must be designed specifically for that purpose, have an activated charcoal filter, and at least one HEPA or ULPA filtration stage.

2.12. PACKAGING

- A. Provide packaging for each miscellaneous hazardous material waste covered by this section which conform to the requirements of 40 CFR 262.30, 40 CFR 761 Subpart D, 49 CFR 173, 49 CFR 178, and 49 CFR 179.

2.13. PERSONAL PROTECTIVE EQUIPMENT (PPE)

- A. General
 - 1. Provide and maintain a sufficient quantity of Personal Protective Equipment (PPE) designed to protect the ears, eyes, face, head, body, lungs, and extremities to all employees engaged in miscellaneous hazardous material removal work in accordance with the requirements of 29 CFR 1926.28, 29 CFR 1926.62, 29 CFR 1926 Subpart E, 29 CFR 1926.95, and other sections of 29 CFR Part 1926 as applicable.
 - 2. Required PPE for persons engaged in miscellaneous hazardous material removal work is anticipated to include, but not be limited to, respiratory protective devices, protective clothing, gloves, protective footwear, eye and face protections, hearing protection, fall protection, protective shields, and barriers. Additional PPE must be provided to persons engaged in miscellaneous hazardous material removal work as necessary to protect those employees due to situations such as: other conditions which may be present at the site, conditions caused as a result of the MHRC's choice

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of means and methods to complete the work, or due to hazards which are incidental to the miscellaneous hazardous material removal work. The MHRC must perform an assessment of the potential hazards present for each work task being performed and must provide PPE as necessary to protect employees and others from those hazards. The assessments must be documented in writing and maintained at the work site. The elements of the assessment may include, but are not limited to, those elements described in Appendix B to 29 CFR 1910.120; Appendix B to Subpart I of 29 CFR 1910; OSHA Publication 3071 for Job Hazard Analysis; or in USACE EM 385-1-1.

3. PPE must be of commercial quality, bear the manufacturer's name, and certified to meet or exceed any performance and labeling requirements specified by applicable regulations. Examples which demonstrate compliance with this requirement include, but are not limited to:
 - a. Respirators which are approved for use by NIOSH in accordance with 42 CFR 84 and meet the requirements of ANSI/ISEA Z88 series standards.
 - b. Protective ensembles which are certified by NFPA 1990.
 - c. Protective clothing meeting the requirements of ANSI/ISEA 101.
 - d. Foot protection meeting the requirements of ASTM F2412 and ASTM F2413.
 - e. Hand protection meeting the requirements of ANSI/ISEA 105.
 - f. Eye and face protection meeting the requirements of ANSI/ISEA Z87.1.
 - g. Head protection meeting the requirements of ANSI/ISEA Z89.1.
 - h. Protective equipment meeting the requirements of ISO 13.340.
- B. Provide the Owner or representative of an authority having jurisdiction with at least two complete sets of personal protective equipment as required for entry into and inspection of all areas of the regulated work area.
- C. Select and use respiratory protective devices in accordance with 29 CFR 1910.134(d).
- D. Breathing air quality and use must meet the requirements of 29 CFR 1910.134(i).

2.14. PLACARDS

- A. Provide placards for each miscellaneous hazardous material waste covered by this section which conform to the requirements of 40 CFR 262.33 and 49 CFR 172 Subpart F.

2.15. POLYETHYLENE SHEETING

- A. All polyethylene sheeting used for miscellaneous hazardous material work including, but not limited to, the containment of regulated work areas, construction of decontamination areas, isolation of HVAC systems, as a drop cloth, glovebags, disposal containers and liners, etc. must meet the following minimum requirements:
 1. Be 6-mil thick or greater.
 2. Must be impermeable.
 3. Meet the performance requirements of ASTM E84, ASTM D4397 or ASTM D4801, and NFPA 701.

2.16. PRESSURE DIFFERENTIAL MONITORING DEVICE

- A. Provide a pressure differential monitoring device for miscellaneous hazardous material work conducted in Negative Pressure Enclosures. The device must:
 1. Be capable of continuous operation.
 2. Be capable of measuring pressure differential in a minimum range of +0.25" to -0.25" of water column.
 3. Have a continuous data logging feature which can store measurements in electronic format, record measurements on physical printouts, or both.

4. Be capable of setting alarm setpoints.
5. Have audible and visual alarm or be able to signal these alarms.

2.17. SANITATION SYSTEMS

- A. Provide potable water; nonpotable water; toilets; food handling; temporary sleeping quarters; washing facilities; eating and drinking areas; vermin control; and change rooms in accordance with 29 CFR 1926.51 and 29 CFR 1926.62.

2.18. SPILL RESPONSE MATERIALS

- A. Provide spill response materials including, but not limited to, containers, absorbent, shovels, and personal protective equipment. Spill response materials must be available at all times when miscellaneous hazardous materials are being handled or transported. Spill response materials must be compatible with the type of material being handled.

2.19. VACUUMS

- A. Use vacuums which have been designed with a HEPA filter as the last filtration stage for general miscellaneous hazardous materials work. The vacuum cleaner must be designed so that all the air drawn into the machine is expelled through the HEPA filter with none of the air leaking past it.
- B. Vacuums used for any work involving mercury dust or vapor must be designed specifically for that purpose, have an activated charcoal filter, and at least one HEPA or ULPA filtration stage.
- C. All vacuums must be operated and maintained in accordance with the manufacturer's instructions.

2.20. WARNING SIGNS AND TAPE

- A. Use warning signs and tape which comply with 29 CFR 1926.200 and ANSI Z535 series standards.

PART 3 - EXECUTION

3.1. GENERAL

- A. No work covered by this section may commence until all required Preconstruction Submittals have been approved, a preconstruction meeting held, the pre-work inspections have been completed, and a written authorization to proceed with the work is provided by the Owner.
- B. All miscellaneous hazardous materials removal work covered by this section must be performed in accordance with the occupational health and safety regulations of 29 CFR Part 1926, 8 AAC 61, and any other applicable occupational health and safety standards. In addition to these requirements, the following requirements apply to specific miscellaneous hazardous materials:
 1. All work involving universal wastes must be performed in accordance with 40 CFR 273, 18 AAC 60, and 18 AAC 62.
 2. All work involving PCB-containing light ballasts must be performed in accordance with 40 CFR 761 and 18 AAC 60.

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3. All work involving heat transfer fluids which are not classified as hazardous waste as defined by 40 CFR 261.3 must be performed in accordance with 40 CFR Subchapter I, 18 AAC 60, 18 AAC 72, and 18 AAC 75.
 4. All work involving equipment with radioactive components must be performed in accordance with 10 CFR Chapter I, 18 AAC 60 and 18 AAC 85.
 5. All work involving ozone depleting substances must be performed in accordance with 40 CFR 82.
 6. All work involving hazardous wastes as defined by 40 CFR 261.3 must be performed in accordance with 40 CFR Subchapter I and 18 AAC 62.
 7. All work involving lead-containing materials must be performed in accordance with 29 CFR 1926.62 and 18 AAC 60.
- C. All miscellaneous hazardous materials transportation work covered by this section must be performed in accordance with the transportation regulations of 49 CFR Subchapter C and 17 AAC 25.
- D. The disposal of miscellaneous hazardous materials covered by this section must be performed in accordance with the regulations of 10 CFR Chapter I, 40 CFR 82, 40 CFR Subchapter I, 40 CFR 761, 49 CFR Subchapter C, and 17 AAC 25.
- E. Comply with applicable codes and requirements related to fire protection and prevention, emergency egress, first aid, and other similarly related elements.

3.2. PRE-WORK ACTIVITIES

- A. The Contractor must perform the following pre-work inspections and preparations prior to starting any work covered by this section:
1. With the assistance of the Owner, determine if there are any special or unique conditions within the work area, such as controls or equipment which may require access during the miscellaneous hazardous materials removal work by non-contractor personnel, that may necessitate modification or revision of the Contractor's approved MHAP.
 2. Determine the extents of each individual work area and the work to be performed within those areas, and confirm that the conditions, work areas, and work to take place is in accordance with the Contractor's approved MHAP.
 3. If the MHAP or other submittal elements required by this section require modification or revision due to discoveries made during the pre-work inspections and preparations, the Contractor must submit those modifications and/or revisions to the Owner for review and approval prior to starting work.

3.3. PRE-WORK NOTIFICATIONS AND AUTHORIZATIONS

- A. This project is not anticipated to require any specific pre-work notifications or authorizations.

3.4. PRE-CLEANING AND WORK AREA PREPARATION ACTIVITIES

- A. There is no requirement to remove all pre-existing dusts, debris, or components contaminated by the miscellaneous hazardous materials from the site unless noted otherwise and elsewhere in this section or the contract documents, or if it is necessary to complete the work in accordance with this section, or because the MHRC or GC determines it to be a more cost-effective means of completing the work.
- B. Work involving the removal of miscellaneous hazardous materials which are intact and not contaminated by other miscellaneous hazardous materials are not required by this section

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to be cleaned and may be performed with moveable objects in place so long as those moveable objects are protected by at least one layer of 6-mil polyethylene sheeting.

- C. Moveable objects remaining in the work area which the Owner chooses to leave in place must be removed prior to establishing the regulated area unless those objects are contaminated by any miscellaneous hazardous material covered by the work of this section. Contaminated moveable objects which are cleanable and can be decontaminated may be cleaned and removed prior to establishing the regulated area. Noncleanable moveable objects must remain in the regulated area and be removed and disposed of after the regulated area has been established.
- D. Non-moveable objects, fixed objects, and remaining exposed surfaces in the work area which are cleanable must be cleaned using industry standard protocols for the type of miscellaneous hazardous material present prior to establishing the regulated area. Non-moveable objects, fixed objects, or remaining surfaces which cannot be cleaned using industry standard protocols for the type of miscellaneous hazardous material present must be decontaminated or removed and disposed of after the regulated area has been established.
- E. Objects and surfaces remaining in the work area after the precleaning activities have been completed must be covered and protected using a minimum of 2 layers of polyethylene sheeting and sealed using duct tape, spray adhesive, or other approved method.

3.5. SPECIFIC REQUIREMENTS OF THIS SECTION

- A. All miscellaneous hazardous materials covered by this section which are defined as a universal waste by 40 CFR 273.9 must be managed as universal wastes by this project in accordance with 40 CFR 273. "Green-tip" or "eco" fluorescent lamps are required by this section to be managed as a universal waste, regardless of mercury content.
- B. Onsite treatment as defined by 40 CFR 260.10 of any wastes covered by this section is prohibited.
- C. All heat transfer fluids which are removed and will not be reused must be sent to an offsite facility for recycling.
- D. Removal of poured polyurethane gym flooring classified as a hazardous waste for mercury must be performed within a Negative Pressure Enclosure (NPE) which meets or exceeds the specifications for an NPE as defined by 29 CFR 1926.1101(g)(5)(i).
 - 1. Exceptions to this requirement:
 - a. Buildings scheduled for complete demolition which will not be reoccupied after abatement and prior to demolition.
 - b. Isolated removal which can be contained using a glovebag or glovebox.
 - 2. The MHRC must maintain a sign-in sheet to record all persons entering and exiting the NPE.
- E. The disturbance of lead-containing materials is subject to regulation by 29 CFR 1926.62, and it is the Contractor's responsibility to review the "trigger tasks" and other requirements of 29 CFR 1926.62 to determine which portions apply, if any, to each unique work task required by this project. The Contractor may elect to have the CPIH collect bulk samples of each affected material to determine if "detectable levels of lead" are present in the material. Any results which indicate lead above the limits of detection must be considered as having "detectable levels of lead" and therefore subject to both the monitoring and testing requirements of this contract. The maximum allowable limit of detection is 60 ppm for the purposes of determining if "detectable levels of lead" are present.

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- F. Negative air machines and local exhaust ventilation must not use any building HVAC systems as a means of transporting air into or out of the regulated areas; must exhaust to the exterior of the building, no less than 30 feet away from building HVAC intakes, and must be exhausted to an area with the least amount of personnel traffic to the greatest extent practicable.
- G. Work conducted adjacent to occupied areas must be obscured from those occupants to the greatest extent practicable.
- H. The MHRC must document all work covered by this section they perform on a written daily log.
- I. Miscellaneous hazardous materials must not be stored onsite for more than 90 days and must be received by the destination facility within 180 days of being shipped off site.

3.6. MATERIALS TESTING REQUIREMENTS

- A. All lead-containing waste streams must be TCLP tested in accordance with 40 CFR 261 to determine disposal requirements. Other miscellaneous hazardous materials which are managed in accordance with this section do not require additional testing.
- B. Testing of the miscellaneous hazardous materials may become required for reasons encountered during the work, including, but not limited to:
 - 1. Additional miscellaneous hazardous materials covered by this section are generated which have not had a hazardous waste determination or been otherwise characterized prior to their generation.
 - 2. If miscellaneous hazardous materials generated by the work covered by this section cannot be managed as specified herein.
 - 3. There is reason to believe that additional potentially hazardous constituents are present in the miscellaneous hazardous materials covered by this section which have not been previously identified and where the presence of those other constituents would affect the Contractor's ability to properly execute any of the worker protection, packaging, labeling, transportation, disposal, documentation, or other requirements of this section.
- C. The Owner must be notified immediately, and prior to, any miscellaneous hazardous materials testing being performed on the wastes covered by this section. Such notification must include the following information:
 - 1. The reason why the miscellaneous hazardous materials cannot be managed as specified herein or otherwise require testing.
 - 2. A sampling and analysis plan.

3.7. MONITORING

- A. General
 - 1. There are no specific monitoring requirements for work involving the removal of intact and otherwise uncontaminated miscellaneous hazardous materials covered by the work of this section unless noted otherwise. However, monitoring may be performed at the Contractor's discretion for any reason. Such optional monitoring must come at no additional cost to the Owner.
 - 2. Work involving the removal of non-intact or otherwise contaminated miscellaneous hazardous materials covered by the work of this section must include:
 - a. Monitoring of personnel performed in accordance with 10 CFR 20, 29 CFR 1926.55, and 8 AAC 61.

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3. Work involving removal of the poured polyurethane gym flooring classified as a hazardous waste for mercury must include:
 - a. Monitoring of personnel performed in accordance with 29 CFR 1926.55 and 8 AAC 61.
 - b. Pre-work sampling to determine ambient mercury vapor concentrations. A minimum of two (2) mercury vapor samples exterior to the building and two (2) samples within the area of removal. The direct reading instrument or sampling and analytical method used must be capable of reporting mercury vapor concentrations below 60 ng/m³. Pre-work sampling must be performed in conditions similar to those typically encountered during normal operations of the facility (e.g. normal ventilation and temperature).
 - c. Monitoring of mercury vapor concentrations using a direct reading instrument at the entrance to the regulated area, waste loadout area during waste loadout operations, and at the approximate location of NPE exhaust discharge. Instruments must be set to alarm at 600 ng/m³. If mercury vapor concentrations exceed the alarm threshold, work must be immediately stopped, and corrective actions must be taken to reduce the concentrations below alarm threshold.
4. Work involving removal of lead-containing materials subject to regulation by 29 CFR 1926.62 must include:
 - a. Monitoring of personnel performed in accordance with 29 CFR 1926.62 and 8 AAC 61.
 - b. Pre-work sampling to determine existing lead in dust concentrations. A minimum of two (2) wipe samples collected within the area of removal and a minimum of two (2) wipe samples collected outside of the area of removal.
5. Where work is being conducted in a facility that meets the definition of a "child occupied facility" as defined by 40 CFR 745.223 but is otherwise not subject to regulation by 40 CFR 745, and the work involves removal of the lead-containing materials subject to regulation by 29 CFR 1926.62, the following monitoring must be performed in addition to other lead-related monitoring requirements of this section:
 - a. Pre-work sampling to determine existing lead in dust concentrations. A minimum of five (5) wipe samples collected within the area of removal and a minimum of five (5) wipe samples collected outside of the area of removal.
6. Wipe samples must be collected from undisturbed surfaces and must be collected from an area typically occupied during normal operations of the facility. Wipe samples must not be collected from the same location as a previous wipe sample.
7. Wipe samples must be of sufficient area to achieve a limit of detection of <10 µg/ft².
8. When required, monitoring must be performed at all times work covered by this section is being conducted for the duration of the work which requires monitoring.
9. Monitoring must be performed by the CPIH.
10. The CPIH must submit lab blanks and field blanks in accordance with the requirements of the analytical method being used.
11. The quantities and types of monitoring required by this section are the minimum requirements and apply to each regulated area and each shift separately.
12. A reduction of monitoring may be permitted at the discretion of the Owner upon written request from the CPIH. Modifications to any monitoring procedures required by this section are prohibited unless the Owner issues a written authorization stating their acceptance of the proposed modifications. No modifications are allowed prior to receiving such authorization.

3.8. WORK AREA INSPECTIONS AND CLEARANCES

A. General:

1. All clearance monitoring and final visual inspections must be performed by the IIHT.
2. Final visual inspections must be performed at the completion of all miscellaneous hazardous materials removal activities, including for intact removal, exterior removal,

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and any other work which disturbs and removes any quantity of miscellaneous hazardous material from any location of the site.

3. All final visual inspections and clearance monitoring must be documented in writing.
 4. Clearance monitoring is only required for work involving the complete removal of poured polyurethane gym flooring classified as a hazardous waste for mercury unless noted otherwise. There are no clearance monitoring requirements for work involving the partial removal of poured polyurethane gym flooring classified as a hazardous waste for mercury or for the removal of any other miscellaneous hazardous material covered by this section when the work is performed in accordance with the requirements of this section.
 5. The IIHT must submit lab blanks and field blanks in accordance with the requirements of the analytical method being used.
 6. The quantities and types of clearance monitoring required by this section are the minimum requirements and apply to each regulated area separately.
 7. Onsite analysis of clearance samples is prohibited.
 8. If any of the clearance samples fails clearance criteria, the work area must be recleaned, receive an additional final visual inspection, and clearance monitoring repeated.
 9. All regulated work areas must retain their status as a regulated work area until the Owner provides written notice that the work area may be deregulated.
- B. Work involving complete removal of poured polyurethane gym flooring classified as a hazardous waste for mercury.
1. Clearance monitoring:
 - a. After satisfactory completion of a final visual inspection, the work area must be sealed and ventilation shut off for a period of at least 24 hours prior to starting clearance monitoring.
 - b. Temperatures inside of the removal boundaries must be maintained at a minimum of 70 degrees Fahrenheit or the maximum space design temperature, whichever is greater, for the duration of the sampling period.
 - c. Ventilation of the space within the removal boundaries during the sampling period is prohibited.
 - d. All clearance monitoring samples must be collected simultaneously and in one sampling period.
 - e. All samples must be collected from within a space located 30"-40" above the floor surface.
 - f. A minimum of five (5) mercury vapor samples must be collected from within the removal boundaries for work involving removal of <1,000 square feet. Collect at least one (1) additional sample for each additional 400 square feet of material removed.
 - g. A minimum of two (2) mercury vapor samples must be collected from spaces typically occupied during normal use of the facility near, but outside of, the removal boundaries.
 - h. A minimum of two (2) mercury vapor samples must be collected from the exterior of the building.
 - i. To achieve satisfactory clearance criteria, mercury vapor concentrations for each sample must be less than 60 ng/m³. If ambient exterior mercury vapor concentrations are greater than 60 ng/m³, then satisfactory clearance criteria is achieved when each sample is no greater than 110% of the ambient exterior mercury vapor concentrations.
- C. Work involving removal of lead-containing materials subject to regulation by 29 CFR 1926.62.
1. At the completion of the lead removal activities, a minimum of two (2) wipe samples collected within the area of removal and a minimum of two (2) wipe samples collected

REMOVAL AND DISPOSAL OF MISCELLANEOUS HAZARDOUS MATERIALS

Division 2
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outside of the area of removal. To achieve satisfactory clearance criteria, each of the samples collected must be $<200 \mu\text{g}/\text{ft}^2$ or less than the existing lead in dust concentrations reported by the pre-work samples, whichever is lower.

2. At the completion of the entire project, a minimum of three (3) wipe samples collected within the area of work for the entire project and a minimum of three (3) wipe samples collected outside of the area of work for the entire project in areas used by workers walking to and from the work area, as a contractor staging area, or other areas which were used by the Contractor during the work. To achieve satisfactory clearance criteria, each of the samples collected must be $<10 \mu\text{g}/\text{ft}^2$.
- D. Where work is being conducted in a facility that meets the definition of a "child occupied facility" as defined by 40 CFR 745.223 but is otherwise not subject to regulation by 40 CFR 745, and the work involves removal of the lead-containing materials subject to regulation by 29 CFR 1926.62.
1. At the completion of the lead removal activities, a minimum of two (2) wipe samples collected within the area of removal and a minimum of two (2) wipe samples collected outside of the area of removal. To achieve satisfactory clearance criteria, each of the samples collected must be $<200 \mu\text{g}/\text{ft}^2$.
 2. At the completion of the entire project, clearance monitoring must be performed using the protocols defined in Chapter VI "Clearance Dust Sampling" found in Chapter 15 of the "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing". To achieve satisfactory clearance criteria, each of the samples collected must be $<10 \mu\text{g}/\text{ft}^2$.

3.9. POST-WORK ACTIVITIES

- A. The MHRC must visually inspect areas impacted by their work activities for potential dust, debris, or contamination resulting from their miscellaneous hazardous materials work that may have been concealed after all regulated area protections, equipment, supplies, and other objects within their possession have been removed from those areas. If any dust, debris, or contamination resulting from their miscellaneous hazardous materials work is noted, the MHRC must promptly clean up the dust or debris and record those actions on their daily report.
- B. The GC, MHRC, and Owner must perform a final walk-thru of the work areas to inspect for any damage that may have occurred as a result of the MHRC's activities at the site.
- C. The MHRC must submit all documentation required by this section for Owner review and approval.
- D. After the MHRC has demobilized from the site and all required submittals approved, then the requirements of this section will have been satisfied and final payment can be made.

END OF SECTION

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Conduit.
- B. Surface Mounted Raceways.
- C. Boxes.
- D. Wireway

1.03 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 1 General Requirements, Division 26 and Division 28.
- B. Division 7 Thermal and Moisture Protection.
- C. Division 8 Openings: Access Doors and Frames.
- D. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.
- E. Section 26 05 26 – Grounding and Bonding for Electrical Systems.
- F. Section 26 05 29 – Hangers and Supports for Electrical Systems.
- G. Section 26 05 53 – Identification for Electrical Systems.

1.04 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
 - 2. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM A 123 – Specification for Zinc Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strip.
- C. National Electrical Manufacturers Association (NEMA):
 - 1. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
 - 2. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
 - 3. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- D. Telecommunications Industry Association (TIA) and Electronics Industries Association (EIA):
 - 1. ANSI/TIA/EIA 568 Commercial Building Telecommunications Cabling Standard.
- E. Building Industry Consulting Service International (BICSI):
 - 1. BICSI Telecommunication Design Methods Manual.

1.05 RACEWAY AND BOX INSTALLATION SCHEDULE

- A. In or through CMU walls:
 - 1. Raceway: Provide rigid steel conduit or intermediate metal conduit. EMT conduit may penetrate through CMU walls where the EMT is installed in a sleeve and does not come in direct contact with the CMU. All conduit in contact with concrete or block shall be rigid steel conduit half lapped wrapped with pipe wrap or be plastic-coated conduit.
 - 2. Boxes and Enclosures: Provide concrete tight cast and listed sheet metal boxes.
- B. Outdoor Above Grade, Damp or Wet Interior Locations:
 - 1. Raceway: Provide rigid steel conduit or intermediate metal conduit.
 - 2. Boxes and Enclosures: Provide weatherproof malleable iron for branch circuit junction and outlet boxes. Provide weatherproof NEMA 3R sheet metal enclosures for safety and disconnect switches and NEMA 4 sheet metal enclosures with gaskets for motor controllers and control panels.
 - 3. Fittings: Provide galvanized malleable iron with gaskets. Provide Myers threaded hubs for all conduit entries into top and side of sheet metal enclosures.
- C. Concealed Dry Locations:
 - 1. Raceway: Provide rigid steel conduit, intermediate metal conduit, or electrical metallic tubing.
 - 2. Boxes and Enclosures: Provide sheet-metal boxes.
 - 3. Fittings: Provide galvanized malleable iron and steel.

D. Exposed Dry Locations:

1. Raceway: Provide rigid steel conduit, intermediate metal conduit, or electrical metallic tubing.
2. Boxes and Enclosures: Provide sheet-metal boxes with raised steel covers.
3. Fittings: Provide galvanized malleable iron and steel.
4. Surface Raceway and Boxes: Where specifically noted on the Drawings, provide surface raceway and boxes.

1.06 DESIGN REQUIREMENTS

A. Raceway Minimum Size:

1. Provide 1/2 inch minimum, unless otherwise noted.
2. Line Voltage Circuits: Raceway is sized on the drawings for copper conductors with 600-Volt type XHHW insulation, unless otherwise noted. Where a raceway size is not shown on the drawings, it shall be calculated to not exceed the percentage fill specified in the NEC Table 1, Chapter 9 using the conduit dimensions of the NEC Table 4, Chapter 9 and conductor properties of the NEC Table 5, Chapter 9.
3. Low-Voltage Circuits: Raceway size shall be calculated to not exceed the percentage fill specified in the NEC Table 1, Chapter 9, using the conduit dimensions of the NEC Table 4, Chapter 9, and cable diameter provided by the manufacturer.

- B. Box Minimum Size: Provide all boxes sized and configured per NEC Article 370 and as specified in this section.

1.07 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Product Data: Submit data for products.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

PART 2. PRODUCTS

2.01 RIGID METAL CONDUIT (RMC)

- A. Rigid Steel Conduit: ANSI C80.1, UL 6.
- B. Rigid Aluminum Conduit: ANSI C80.5.
- C. Fittings and Conduit Bodies: NEMA FB 1, UL 514B; Galvanized malleable iron with threaded hubs for all conduit entries. Provide threaded connections and couplings only. Set Screw and running thread fittings are not permitted.
- D. Provide insulated throat bushings at all conduit terminations.

2.02 INTERMEDIATE METAL CONDUIT (IMC)

- A. Product Description: ANSI C80.6, UL 1242; Galvanized Steel Conduit.
- B. Fittings and Conduit Bodies: NEMA FB 1, UL 514B; use fittings and conduit bodies specified above for rigid steel conduit.
- C. Provide insulated throat bushings at all conduit terminations.

2.03 FLEXIBLE METAL CONDUIT (FMC)

- A. Product Description: UL 1, FS WW-C-566; galvanized or zinc-coated flexible steel, full-wall or reduced wall thickness.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel or malleable iron with insulated throat bushings. Die cast zinc or threaded inside throat fittings are not acceptable.

2.04 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

- A. Product Description: UL 360, flexible metal conduit with interlocked steel construction and PVC jacket.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; liquid tight steel or malleable iron with insulated throat bushings. Die cast fittings are not acceptable.

2.05 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3, UL 797; galvanized steel tubing.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel or malleable iron, compression or set screw type with insulated throat bushings. Zinc die cast or indented fittings are not acceptable.
- C. Provide factory elbows on sizes 1-1/2" and larger.

2.06 SURFACE METAL RACEWAY

- A. General Requirements: Surface steel raceway with ivory finish, fitted snap-on cover, and steel accessories, suitable for use as multi-outlet assembly. Keep data and power conductors separate at all times. Provide radius fittings and all other accessories as required for a complete installation. Raceway covers with knockouts for accessories or cable entries are not acceptable. Device spacing shall be as indicated on the Drawings.
- B. Single-Channel, Power and Data: Basis of Design is Wiremold V2000 series.

2.07 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, UL514A galvanized steel, with plaster ring where applicable.
 - 1. Minimum Size: 4 inches square or octagonal, 1-1/2 inches deep, unless otherwise noted.
 - 2. Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch male fixture studs where required. Minimum Size: 4 inches square or octagonal, 2-1/8 inches deep.

- 3. Telecommunications Outlets: Minimum size 4-11/16 inches square, 2-1/8 inches deep.
- B. Cast Boxes: NEMA FB 1, Type FD, galvanized malleable iron or copper-free cast aluminum. Furnish gasketed cover by box manufacturer. Furnish threaded hubs. "Bell" boxes are not allowed.

2.08 PULL AND JUNCTION BOXES

- A. Sheet Metal Pull and Junction Boxes: ANSI/NEMA OS 1, UL514A galvanized steel.
 - 1. Minimum Size: 4 inches square or octagonal, 1-1/2 inches deep, unless otherwise noted.
- B. Sheet Metal Boxes Larger Than 12 Inches in Any Dimension: Hoffman or approved equal.
- C. Boxes for Outdoor and Wet Location Installations: NEMA 250, Type 4 or 4X; flat-flanged, surface mounted junction box:
 - 1. Material: Galvanized cast iron.
 - 2. Cover: Furnish with ground flange, neoprene gasket, and stainless-steel cover and screws.

2.09 BUSHINGS

- A. Non-grounding: Threaded impact resistant plastic.
- B. Grounding: Insulated galvanized malleable iron/steel with hardened screw bond to raceway and conductor lug.

2.10 LOCKNUTS

- A. Threaded Electro Zinc Plated Steel designed to cut through protective coatings for ground continuity.

PART 3. EXECUTION

3.01 INSTALLATION

- A. Ground and bond raceway and boxes in accordance with Section 26 05 26.
- B. Provide support and fasten raceway and box supports to structure and finishes in accordance with Section 26 05 29.
- C. Identify raceway and boxes in accordance with Section 26 05 53.
- D. Unless otherwise noted, do not inter-mix conductors from separate panelboards or any other system in the same raceway system or junction boxes.

3.02 INSTALLATION - GENERAL RACEWAY

- A. Install raceway for all systems, unless otherwise noted.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

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- B. Install an equipment grounding conductor inside of all raceways containing line voltage conductors.
- C. Provide raceways concealed in construction unless specifically noted otherwise, or were installed at surface cabinets and equipment connections and in Mechanical and Electrical Equipment rooms. Do not route conduits on roofs, outside of exterior walls, or along the surface of interior finished walls unless specifically noted on the plans.
- D. Raceway routing and boxes are shown in approximate locations unless dimensioned. Where raceway routing is not denoted, field-coordinate to provide complete wiring system.
- E. Do not route raceways on floor. Where surface raceways are allowed in equipment rooms, arrange raceway and boxes to maintain a minimum of 6 feet 6 inches of headroom and present a neat appearance. Install raceways level and square. Route exposed raceways and raceways above accessible ceilings parallel and perpendicular to walls, ceiling, and adjacent piping.
- F. Maintain minimum 6-inch clearance between raceway and mechanical and piping and ductwork. Maintain 12-inch clearance between raceway and heat sources such as flues, steam pipes, heating pipes, heating appliances, and other surfaces with temperatures exceeding 104 degrees F.
- G. Do not install raceway embedded in spray applied fire proofing.
- H. Route raceway through roof openings for piping and ductwork where possible; otherwise, route through roof jack with pitch pocket. Coordinate all requirements with Division 7 of these specifications.
- I. Where raceway penetrates fire-rated walls and floors, seal raceway penetrations of fire-rated walls, ceilings, floors in accordance with the requirements of Section 26 05 00 and Division 7.
- J. Raceways and boxes penetrating vapor barriers or penetrating areas from cold to warm shall be taped and sealed with a non-hardening duct sealing compound to prevent the accumulation of moisture, and shall include a vapor barrier on the outside.
- K. Conduit embedded in concrete or solid masonry shall not be larger than 1/3 the thickness of the wall or slab and shall be spaced not less than three diameters apart. No cutting of reinforcing bars shall be permitted unless specifically approved. Should structural members prevent the installation of conduit or equipment, notify the Owner or Contracting Officer before proceeding.
- L. Route conduits in slabs to have 1-inch minimum cover. Conduits in slab shall not compromise the structural integrity of the slab.
- M. Arrange raceway supports to prevent misalignment during wiring installation.
- N. Do not attach raceway to ceiling support wires or other piping systems and do not fasten raceway with wire or perforated pipe straps. Remove all wire used for temporary raceway support during construction, before conductors are pulled. Raceway shall be installed to permit ready removal of equipment, piping, ductwork, or ceiling tiles.

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- O. Group raceway in parallel runs where practical and use conduit rack constructed of steel channel with conduit straps or clamps, as specified in Section 26 05 29. Provide space on each rack for 25 percent additional raceway.
- P. Cut conduit square; de-burr cut ends. Bring conduit to the shoulder of fittings and couplings and fasten securely.
- Q. Use threaded raintight conduit hubs for fastening conduit to cast boxes, and for fastening conduit to sheet metal boxes in damp or wet locations. Sealing locknuts are not acceptable.
- R. Install no more than 360-degrees of bends between boxes.
- S. Install conduit bodies to make sharp changes in direction, such as around beams. "Goosenecks" in conduits are not acceptable.
- T. Provide protective plastic bushings or insulated throat bushings at each raceway termination not installed to an enclosure. Bushings shall be threaded to the raceway end or connector.
- U. Avoid moisture traps; install junction box with drain fitting at low points in raceway system.
- V. Install fittings and flexible metal conduit to accommodate 3-axis movements where raceway crosses seismic joints.
- W. Install fittings designed and listed to accommodate expansion and contraction where raceway crosses control and expansion joints.
- X. Use suitable caps to protect installed raceway against entrance of dirt and moisture.
- Y. Paint all exposed conduit in finished spaces to match surface to which it is attached or crosses. Clean greasy or dirty conduit prior to painting in accordance with paint manufacturer's instructions. Where raceway penetrates non-rated ceilings, floors or walls, provide patching, paint and trim to retain architectural aesthetics similar to surroundings.

3.03 REUSE OF EXISTING CONDUITS

- A. Where shown on Drawings that existing conduits may be used, that is only applicable if the existing conduit meets the following minimum criteria:
 - 1. Conduit is sized per minimum NEC requirements.
 - 2. Conduit is properly supported as required in the Contract Documents.
 - 3. Conduit is in good, useable condition and is not deformed, damaged or showing signs of corrosion.
 - 4. Conduit is of the type specified and allowable in the Contract Documents.

3.04 INSTALLATION – GENERAL BOXES

- A. Provide electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and code compliance. All electrical box locations shown on Drawings are approximate unless dimensioned.

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- B. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only. Where installation is inaccessible, install outlet and junction boxes no more than 6 inches from ceiling access panel. Coordinate locations and sizes of required access doors with Division 8.
- C. Coordinate layout and installation of boxes to provide adequate headroom and working clearance and to present a neat appearance. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.
- D. Unless otherwise dimensioned on Plans, align wall-mounted outlet boxes for switches, thermostats, and similar devices.
- E. Adjust box location up to 6 feet prior to rough-in to accommodate intended purpose.
- F. Provide knockout closures for unused openings.
- G. Install boxes in walls without reducing effectiveness of wall insulation or vapor barrier.
- H. Install with minimum 24 inches separation in fire rated walls. Limit penetrations in fire rated walls to 16 square inches each and a maximum total combined penetration area of 100 square inches in any given 100 square feet of wall. Where penetrations are in excess of these requirements, provide UL listed fire stop wrap acceptable to Authority having Jurisdiction.
- I. Do not fasten boxes to ceiling support wires or other piping systems.
- J. Support boxes independently of conduit.
- K. Clean interior of boxes to remove dust, debris, and other material and clean exposed surfaces and restore finish.
- L. Provide blank covers or plates for all boxes that do not contain devices.

3.05 INSTALLATION – SURFACE RACEWAY

- A. Install screws, clips, and straps to fasten raceway channel to surfaces; mount plumb and level. Install insulating bushings and inserts at connections to outlets and corner fittings. Provide divider to keep power and data pathways separate at all times. Bond each section together to provide electrically continuous system.
- B. Close ends and unused openings in wireway and surface raceway.
- C. Where wall surface is uneven, installer shall fur out wall section to match surface raceway dimensions and surface boxes dimensions as required. Furring shall be painted to match surface raceway.
- D. Install surface raceway cover with no gaps, scratches, or deformities. Covers not acceptable to Owner shall be replaced by the Contractor at no additional cost.
- E. Cuts: Perform all cuts with raceway base and cover shear specifically designed for installed raceway system.

3.06 INSTALLATION – TELECOMMUNICATION RACEWAY AND SLEEVES

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- A. Provide continuous pathway system for all telecommunication cables. Provide cable pathway support in accordance with Section 26 05 29.
- B. Provide separation clearances in accordance with Section 27 10 00.
- C. Install the telecommunication pathways in accordance with requirements for Installation of General Conduit and General Boxes above unless superseded by more stringent requirements of this section or ANSI/TIA568-D and the latest published edition of the BICSI Telecommunication Distribution Methods Manual guidelines and recommendations.
- D. Provide pathways for all telecommunication cables with Surface Raceway, Conduit, Cable tray, J-hooks, and chases for the entire length of each cable. Provide pathway capacity throughout entire system for each telecommunication outlet served sized to accommodate a minimum of four (or more where shown on the Plans) 4-pair 100-Ohm UTP cables from each outlet location to telecommunication room denoted on the plans.
- E. Conduit Pathways:
 - 1. Install pull boxes in continuous straight runs of conduit longer than 100 feet.
 - 2. Maximum allowable continuous conduit section length of 100 feet between pull boxes.
 - 3. Contain no more than two 90-degree bends or de-rate conduit capacity 15% for up to one additional 90-degree bend. Conduits less than 33 feet long, oversized one trade size or with one of the 90-degree bends within 12 inches of a pull box may have up to three 90-degree bends without de-rating.
 - 4. Rate each offset as a 90-degree bend.
 - 5. Bond each conduit to telecommunication ground system.
 - 6. Condulets (LB fittings) shall not be installed in any telecommunications raceway.
 - 7. Do not use flexible metal conduit unless specifically noted on the plans or approved by the engineer where it is the only practical alternative. Increase raceway one trade size above required size where flexible metal conduit is used.
 - 8. Terminate conduits routed to cable trays within 6 inches of tray. Provide conduit support to building structure within 24 inches of cable tray.
 - 9. Terminate conduits and chases that protrude through floor in telecommunication rooms to 3 inches above finished floor. Terminate conduits and chases that protrude through finished ceiling or above within 12 inches of ladder rack, distribution frame or cable organizer.
 - 10. Provide bend radius of 6 times of the internal conduit diameter of conduits up to 2 inches; 10 times of the internal conduit diameter of conduits above 2 inches and for all fiber optic raceways.
 - 11. Provide conduit pathways through walls with insulated bushings on each end for all wall penetrations of cables.
 - 12. Size all conduits, sleeves and chases according to the following table:

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Conduit Trade size	Conduit Maximum Cable Capacity Based on two 90 degree bends and < 100 ft (Inches OD of Cable)									
	(0.13")	(0.18")	(0.22")	(0.24")	(0.29")	(0.31")	(0.37")	(0.53")	(0.62")	(0.70")
0.75"	6	5	4	3	2	2	1	0	0	0
1"	8	8	7	6	3	3	2	1	0	0
1.25"	16	14	12	10	6	4	3	1	1	1
1.5"	20	18	16	15	7	6	4	2	1	1
2"	30	26	22	20	14	12	7	4	3	2
2.5"	45	40	36	30	17	14	12	6	3	3
3"	70	60	50	40	20	20	17	7	6	6
3.5"							22	12	7	6
4"							30	14	12	7

- F. Provide J-Hooks in accordance with Section 26 05 29 to provide telecommunication pathway anywhere cable tray, conduit, or ladder rack is not denoted on the plans and one or more telecommunication cables are routed.
- G. Provide innerduct the entire length in conduits denoted to contain innerducts. Size innerducts to use entire available capacity of the outer conduit.
- H. Do not install innerduct and other cables in the same raceway.

3.07 INSTALLATION – TELECOMMUNICATION BOXES

A. Boxes:

- 1. All boxes shall be readily accessible.
- 2. Do not use boxes for angle pulls or change pathway direction. Locate pull boxes in straight through sections of horizontal conduit pathways.
- 3. Provide pull boxes for 3/4-inch and 1-inch through pull for horizontal UTP cabling. Provide all other boxes sized per the following table:

Maximum Trade Size Conduit	Minimum Size of Pull Box in Inches			For each additional conduit increase width in inches
	Width	Length (direction of conduit)	Depth	
0.75"	4	12	3	2
1"	4	16	3	2
1.25"	6	20	3	3
1.5"	8	27	4	4
2"	8	36	4	5
2.5"	10	42	5	6
3"	12	48	5	6
3.5"	12	54	6	6
4"	15	60	8	8

END OF SECTION

CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Reinforcing bars.
2. Welded wire fabric.
3. Reinforcement accessories.

B. Related Requirements:

1. Section 03 30 00 - Cast-in-Place Concrete: Cast-in-place or in-situ concrete for structural building frame, slabs on grade, and other concrete components associated with building.

1.2 REFERENCE STANDARDS

A. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 318 - Building Code Requirements for Structural Concrete.
3. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures.
4. ACI SP-66 - ACI Detailing Manual.

B. American Welding Society:

1. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

C. ASTM International:

1. ASTM A184 - Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement.
2. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
3. ASTM A704 - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.
4. ASTM A706 - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
5. ASTM A767 - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
6. ASTM A775 - Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
7. ASTM A884 - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement.
8. ASTM A934 - Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.
9. ASTM A996 - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.
10. ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

- D. Concrete Reinforcing Steel Institute:
 - 1. CRSI 10-MSP - Manual of Standard Practice.
 - 2. CRSI 10PLACE - Placing Reinforcing Bars.

1.3 COORDINATION

- A. Section 01300 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with placement of formwork, formed openings, and other Work.

1.4 PREINSTALLATION MEETINGS

- A. Section 01300 - Administrative Requirements: Requirements for preinstallation meeting.

1.5 SUBMITTALS

- A. Section 01300 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings:
 - 1. Indicate bar sizes, spacings, locations, splice locations, and quantities of reinforcing steel and welded wire fabric.
 - 2. Indicate bending and cutting schedules.
 - 3. Indicate supporting and spacing devices.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Submit certified copies of mill test report of reinforcement materials analysis.
- E. Welder Certificates: Certify welders and welding procedures employed on Work, verifying AWS qualification within previous 12 months.
- F. Qualifications Statement:
 - 1. Welders: Qualify procedures and personnel according to AWS D1.1.

1.6 QUALITY ASSURANCE

- A. Perform Work according to ACI 318.
- B. Prepare Shop Drawings according to ACI SP-66.

1.7 QUALIFICATIONS

- A. Welders: AWS qualified within previous 12 months for employed weld types.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.9 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 REINFORCEMENT

- A. Reinforcing Steel:
 - 1. Comply with ASTM A615.
 - 2. Yield Strength: 60 ksi.
 - 3. Billet Bars: Deformed.
 - 4. Finish: Uncoated.
- B. Welded Plain Wire Fabric:
 - 1. Comply with ASTM A1064.
 - 2. Configuration: Flat sheets.

2.2 FABRICATION

- A. Fabricate concrete reinforcement according to ACI 318.
- B. Form standard hooks for 180-degree bends, 90-degree bends, stirrups and tie hooks, and seismic hooks as indicated on Drawings.
- C. Form reinforcement bends with minimum diameters according to ACI 318.
- D. Fabricate column reinforcement with offset bends at reinforcement splices.

2.3 ACCESSORY MATERIALS

- A. Tie Wire:
 - 1. Minimum 16 gage, annealed type.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Place, support, and secure reinforcement against displacement.
- B. Do not deviate from required position beyond specified tolerance.
- C. Do not weld crossing reinforcement bars for assembly.
- D. Do not displace or damage vapor retarder.
- E. Accommodate placement of formed openings.
- F. Maintain minimum concrete cover around reinforcement according to ACI 318 as follows:
 - 1. Footings and Concrete Formed against Earth: 3 inches.
 - 2. Concrete Exposed to Earth or Weather:
 - a. No. 6 Bars and Larger: 2 inches
 - b. No. 5 Bars and Smaller: 1-1/2 inches
 - 3. Supported Slabs, Walls, and Joists:
 - a. No. 14 Bars and Larger: 1-1/2 inches
 - b. No. 11 Bars and Smaller: 3/4 inch
 - 4. Beams and Columns: 1-1/2 inches

3.2 TOLERANCES

- A. Section 01400 - Quality Requirements: Requirements for tolerances.
- B. Install reinforcement within following tolerances for flexural members, walls, and compression members:
 - 1. Reinforcement Depth Greater Than 8 Inches:
 - a. Depth Tolerance: Plus or Minus 3/8 inch
 - b. Minus 3/8 inch
 - 2. Reinforcement Depth Less Than or Equal to 8 Inches:

- a. Depth Tolerance: Plus or Minus 1/2 inch
 - b. Minus 1/2 inch
- C. Foundation Walls: Install reinforcement within tolerances according to ACI 530/530.1.

3.3 FIELD QUALITY CONTROL

- A. Section 01400 - Quality Requirements: Requirements for inspecting and testing.
- B. Field inspection and testing will be performed by Owner's testing laboratory according to ACI 318.
- C. Provide unrestricted access to Work and cooperate with appointed inspection and testing firm.

END OF SECTION

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes Cast-in-Place Concrete for Following Items:
 - 1. Foundation walls.
 - 2. Footings.
 - 3. Slabs on grade.
- B. Related Requirements:
 - 1. Section 03 20 00 - Concrete Reinforcing: Requirements for reinforcing steel and supports.

1.2 REFERENCE STANDARDS

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
 - 2. ACI 305R - Guide to Hot Weather Concreting.
 - 3. ACI 306.1 - Standard Specification for Cold Weather Concreting.
 - 4. ACI 308.1 - Specification for Curing Concrete.
 - 5. ACI 318 - Building Code Requirements for Structural Concrete.
- B. ASTM International:
 - 1. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 2. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 - 3. ASTM C33 - Standard Specification for Concrete Aggregates.
 - 4. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - 5. ASTM C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
 - 6. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
 - 7. ASTM C143 - Standard Test Method for Slump of Hydraulic-Cement Concrete.
 - 8. ASTM C150 - Standard Specification for Portland Cement.
 - 9. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
 - 10. ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
 - 11. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
 - 12. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
 - 13. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
 - 14. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
 - 15. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
 - 16. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.

17. ASTM C685 - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing.
18. ASTM C845 - Standard Specification for Expansive Hydraulic Cement.
19. ASTM C989 - Standard Specification for Slag Cement for Use in Concrete and Mortars.
20. ASTM C1017 - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
21. ASTM C1064 - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
22. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
23. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete.
24. ASTM C1157 - Standard Performance Specification for Hydraulic Cement.
25. ASTM C1218 - Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
26. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
27. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
28. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
29. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
30. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
31. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
32. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
33. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
34. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

1.3 COORDINATION

- A. Section 01300 - Administrative Requirements: Requirements for coordination.
- B. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

1.4 SUBMITTALS

- A. Section 01300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit data on joint devices, attachment accessories, admixtures.
- C. Design Data:
 1. Submit concrete mix design for each concrete strength.
 2. Submit separate mix designs if admixtures are required for following:
 - a. Hot and cold weather concrete Work.
 - b. Air entrained concrete Work.
 3. Identify mix ingredients and proportions, including admixtures.

4. Identify chloride content of admixtures and whether or not chlorides were added during manufacture.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer Instructions: Submit installation procedures and interfacing required with adjacent Work.

F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.5 CLOSEOUT SUBMITTALS

A. Section 01700 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of embedded utilities and components concealed from view in finished construction.

1.6 QUALITY ASSURANCE

A. Perform Work according to ACI 318.

B. Comply with ACI 305R when pouring concrete during hot weather.

C. Comply with ACI 306.1 when pouring concrete during cold weather.

D. Acquire cement and aggregate from one source for Work.

1.7 AMBIENT CONDITIONS

A. Section 01500 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.

B. Maintain concrete temperature after installation at minimum 50 degrees F for minimum seven days.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Concrete:

1. Cement:

a. Comply with ASTM C150, Type I /II..

b. Type: Portland.

2. Normal Weight Aggregates:

a. Comply with ASTM C33.

3. Water:
 - a. Comply with ACI 318.
 - b. Potable.

B. Admixtures:

1. Air Entrainment: Comply with ASTM C260.
2. Chemical:
 - a. Comply with ASTM C494.
3. Plasticizing:
 - a. Comply with ASTM C1017.

C. Joint Devices and Filler:

1. Joint Filler, Type A:
 - a. Description: Asphalt-impregnated fiberboard or felt.

2.2 CONCRETE MIX

A. Select proportions for concrete according to ACI 318 trial mixtures or field test data or both.

B. Exterior Concrete:

1. Compressive Strength: 4,000 psi
2. Aggregate Type: Normal weight.
3. Maximum Water-Cement Ratio: 0.45 by weight
4. Aggregate Size:
 - a. Maximum: 1 inch
5. Air Content: 6 percent, plus or minus 1 percent.
6. Admixture Type: As required.
7. Slump: 4 inches, plus or minus 1 inch

C. Foundations:

1. Compressive Strength: 3,000 psi
2. Aggregate Type: Normal weight.
3. Maximum Water-Cement Ratio: 0.50 by weight
4. Aggregate Size:
 - a. Maximum: 1 inch
5. Air Content: 5 percent, plus or minus 1 percent.
6. Admixture Type: As required.
7. Slump: 4 inches, plus or minus 1 inch

D. Slab on Grade:

1. Compressive Strength: 4,000 psi
2. Aggregate Type: Normal weight.

3. Maximum Water-Cement Ratio: 0.45 by weight
4. Aggregate Size:
 - a. Maximum: 1 inch
5. Air Content: 3% maximum, no air entrainment.
6. Admixture Type: As required.
7. Slump: 4-8 inches, plus or minus 1 inch

E. Admixtures:

1. Include admixture types and quantities indicated in concrete mix designs only if approved by Architect/Engineer.
2. Cold Weather:
 - a. Use accelerating admixtures in cold weather.
 - b. Use of admixtures will not relax cold-weather placement requirements.
3. Do not use calcium chloride or admixtures containing calcium chloride.
4. Add air entrainment admixture to concrete mix for Work exposed to freezing and thawing or deicing chemicals.

F. Ready-Mixed Concrete: Mix and deliver concrete according to ASTM C94.

G. Site-Mixed Concrete: Mix concrete according to ACI 318.

2.3 ACCESSORIES

A. Vapor Retarder:

1. Description: Clear polyethylene film.
2. Thickness: 10 mils.
3. Type: As recommended for below-grade application.
4. Joint Tape: As recommended by manufacturer.

B. Non-shrink Grout:

1. Description: Premixed compound consisting of non-metallic aggregate, cement, and water-reducing and plasticizing agents.
2. Comply with ASTM C1107.
3. Minimum Compressive Strength: 2,400 psi in 48 hours and 7,000 psi in 28 days.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01700 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify requirements for concrete cover over reinforcement.
- C. Verify that anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.2 PREPARATION

- A. Section 01700 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Previously Placed Concrete:
 - 1. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.
 - 2. Remove laitance, coatings, and unsound materials.
- C. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels, and pack solid with non-shrink grout.
- D. Remove debris and ice from formwork, reinforcement, and concrete substrates.
- E. Remove water from areas receiving concrete before concrete is placed.

3.3 INSTALLATION

- A. Placing Concrete:
 - 1. Place concrete according to ACI 301.
 - 2. Notify testing laboratory and Architect/Engineer minimum 24 hours prior to commencement of operations.
 - 3. Ensure that reinforcement, inserts, embedded parts, formed expansion and contraction joints are not disturbed during concrete placement.
 - 4. Install vapor retarder under interior slabs on grade according to ASTM E1643.
 - 5. Lap joints minimum 6 inches and seal watertight by taping edges and ends.
 - 6. Repairs:
 - a. Repair vapor retarder damaged during placement of concrete reinforcement.
 - b. Using vapor retarder material, lap over damaged areas minimum 6 inches and seal watertight.
 - 7. Joint Filler:
 - a. Separate slabs on grade from vertical surfaces with joint filler.
 - 8. Deposit concrete at final position, preventing segregation of mix.
 - 9. Place concrete in continuous operation for each panel or section as determined by predetermined joints.
 - 10. Consolidate concrete.
 - 11. Maintain records of concrete placement, including date, location, quantity, air temperature, and test samples taken.
 - 12. Place concrete continuously between predetermined expansion, control, and construction joints.
 - 13. Do not interrupt successive placement and do not permit cold joints to occur.
 - 14. Saw-Cut Joints:
 - a. Saw-cut joints within 12 hours after placing.
 - b. Use 3/16 inch thick blade.
 - c. Cut into 1/4 depth of slab thickness.

15. Screeding:

- a. Screed floors and slabs on grade level.
- b. Surface Flatness: maximum 1/4 inch in 10 feet.

B. Concrete Finishing:

1. Finish concrete floor surfaces according to ACI 301.
2. Wood float surfaces receiving quarry tile, ceramic tile, with full-bed setting system.
3. Steel trowel surfaces receiving carpeting, resilient flooring, seamless flooring.
4. Steel trowel surfaces indicated to be exposed.
5. In areas with floor drains, maintain floor elevation at walls and pitch surfaces uniformly to drains at 1/8 inch per foot nominal.

C. Curing and Protection:

1. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
2. Maintain concrete with minimal moisture loss at relatively constant temperature for period as necessary for hydration of cement and hardening of concrete.
3. Cure concrete according to ACI 308.1.

3.4 FIELD QUALITY CONTROL

A. Perform inspection and testing according to ACI 318.

B. Provide unrestricted access to Work and cooperate with appointed testing and inspection firm.

C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.

D. Concrete Inspections:

1. Continuous Placement Inspection: Inspect for proper installation procedures.
2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.

E. Strength Test Samples:

1. Sampling Procedures: Comply with ASTM C172.
2. Cylinder Molding and Curing Procedures:
 - a. Comply with ASTM C31.
 - b. Cylinder Specimens: Field cured.
3. Sample concrete and make one set of three cylinders for every 10 cu. yd. or less of each class of concrete placed each day, and for every 5,000 sq. ft. of surface area for slabs and walls.
4. If volume of concrete for a class of concrete would provide less than five sets of cylinders, take samples from five randomly selected batches, or from every batch if less than five batches are used.
5. Make one additional cylinder during cold weather concreting and field cure.

F. Field Testing:

1. Slump Test Method: Comply with ASTM C143.
2. Air Content Test Method: Comply with ASTM C173.
3. Temperature Test Method: Comply with ASTM C1064.
4. Compressive Strength Concrete:
 - a. Measure slump and temperature for each sample.
 - b. Measure air content in air-entrained concrete for each sample.

G. Cylinder Compressive Strength Testing:

1. Test Method: Comply with ASTM C39.
2. Test Acceptance: According to ACI 318.
3. Test one cylinder at seven days.
4. Test one cylinder at 28 days.
5. Retain one cylinder for testing when requested by Architect/Engineer.
6. Dispose of remaining cylinders if testing is not required.

H. Patching:

1. Allow Architect/Engineer to inspect concrete surfaces immediately upon removal of forms.
2. Honeycombing or Embedded Debris in Concrete:
 - a. Not acceptable.
 - b. Notify Architect/Engineer upon discovery.
3. Patch imperfections according to ACI 301.

I. Defective Concrete:

1. Description: Concrete not conforming to required lines, details, dimensions, tolerances, or specified requirements.
2. Repair or replacement of defective concrete will be determined by Architect/Engineer.
3. Do not patch, fill, touch up, repair, or replace exposed concrete except upon express direction of Architect/Engineer for each individual area.

END OF SECTION

STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural shapes.
2. Channels and angles.
3. Hollow structural sections.
4. Structural pipe.
5. Structural plates and bars.
6. Bolts, connectors, and anchors.
7. Grout.

B. Related Requirements:

1. Section 05 31 00 - Steel Roof Decking: Support framing for small openings in roof deck.

1.2 REFERENCE STANDARDS

A. American Institute of Steel Construction:

1. AISC 303 - Code of Standard Practice for Structural Steel Buildings and Bridges.
2. AISC 341 - Seismic Provisions for Structural Steel Buildings.
3. AISC 360 - Specification for Structural Steel Buildings.

B. American Society of Civil Engineers:

1. ASCE 19 - Structural Applications of Steel Cables for Buildings.

C. American Welding Society:

1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
2. AWS D1.1 - Structural Welding Code - Steel.

D. ASTM International:

1. ASTM A36 - Standard Specification for Carbon Structural Steel.
2. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
3. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
4. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
5. ASTM A193 - Standard Specification for Alloy-Steel and Stainless-Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
6. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
7. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

8. ASTM A354 - Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners.
9. ASTM A449 - Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use.
10. ASTM A490 - Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.
11. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
12. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
13. ASTM A514 - Standard Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding.
14. ASTM A529 - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality.
15. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
16. ASTM A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
17. ASTM A588 - Standard Specification for High-Strength Low-Alloy Structural Steel, up to 50 ksi [345 MPa] Minimum Yield Point, with Atmospheric Corrosion Resistance.
18. ASTM A618 - Standard Specification for Hot-Formed Welded and Seamless High-Strength Low-Alloy Structural Tubing.
19. ASTM A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
20. ASTM A786 - Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
21. ASTM A847 - Standard Specification for Cold-Formed Welded and Seamless High-Strength, Low Alloy Structural Tubing with Improved Atmospheric Corrosion Resistance.
22. ASTM A913 - Standard Specification for High-Strength Low-Alloy Steel Shapes of Structural Quality, Produced by Quenching and Self-Tempering Process.
23. ASTM A992 - Standard Specification for Structural Steel Shapes.
24. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
25. ASTM E94 - Standard Guide for Radiographic Examination.
26. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments.
27. ASTM E165 - Standard Practice for Liquid Penetrant Examination for General Industry.
28. ASTM E709 - Standard Guide for Magnetic Particle Testing.
29. ASTM F436 - Standard Specification for Hardened Steel Washers.
30. ASTM F959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners.
31. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
32. ASTM F1852 - Standard Specification for "Twist Off" Type Tension Control Structural Bolt/Nut/Washer Assemblies, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
33. ASTM F2329 - Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.

E. Research Council on Structural Connections:

1. RCSC - Specification for Structural Joints Using ASTM A325 or A490 Bolts.

F. SSPC: The Society for Protective Coatings:

1. SSPC - Steel Structures Painting Manual.

2. SSPC Paint 15 - Steel Joist Shop Primer/Metal Building Primer.
3. SSPC Paint 20 - Zinc-Rich Coating (Type I - Inorganic and Type II - Organic).
4. SSPC SP 3 - Power Tool Cleaning.
5. SSPC SP 6 - Commercial Blast Cleaning.
6. SSPC SP 10 - Near-White Blast Cleaning.

1.3 COORDINATION

- A. Division 0 and 1 for coordination requirements.

1.4 SUBMITTALS

- A. Division 1 for submittal requirements.
- B. Shop Drawings:
 1. Indicate profiles, sizes, spacing, locations of structural members, openings attachments, and bolts.
 2. Connections.
 3. Cambers.
 4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.
- D. Mill Test Reports: Submit indicating structural strength, destructive and non-destructive test analysis.
- E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- F. Qualifications Statements:
 1. Submit qualifications for fabricator, erector, shop painter, and welders.

1.5 QUALITY ASSURANCE

- A. Perform Work according to following:
 1. Structural Steel: ASIC 341 and AISC 360.
 2. Architecturally Exposed Structural Steel: AISC 303, Section 10.
 3. High-Strength Bolted Connections: RCSC - Specification for Structural Joints Using ASTM A325 or ASTM A490 Bolts.
 4. Steel Cable Structures: ASCE 19.

1.6 QUALIFICATIONS

- A. Fabricator:
 1. Company specializing in fabricating products specified in this Section with minimum three years' documented experience with following current AISC Certification:

- a. Standard Steel Building Structures (STD).
- B. Erector:
 - 1. Company specializing in performing Work of this Section with minimum three years' documented experience with following current AISC Certification:
 - a. Certified Steel Erector (CSE).
 - b. For the structural Erector, In lieu of AISC certification, three years of documented experience with similar structures will be accepted.
- C. Shop Painter:
 - 1. Company specializing in performing Work of this Section with minimum three years' documented experience with following current AISC Certification:
 - a. Sophisticated Paint Endorsement - Enclosed (P1).
- D. Welders and Welding Procedures: AWS D1.1 qualified within previous 12 months.

PART 2 - PRODUCTS

2.1 STRUCTURAL STEEL

- A. Structural W-Shapes: ASTM A992.
- B. Structural T-Shapes: Cut from structural W-shapes.
- C. Channels and Angles: ASTM A36.
- D. Round, Hollow Structural Sections: ASTM A500, Grade B.
- E. Rectangular, Hollow Structural Sections: ASTM A500, Grade C.
- F. Structural Pipe: ASTM A53, Grade B.
- G. Structural Plates and Bars: ASTM A36.
- H. Gusset Plates: ASTM A572; Grade 50.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. Bolts: Heavy-hex, structural type.
 - 1. ASTM A325; Type 1, plain, or Type 3, plain.
 - 2. ASTM A490; Type 1 or 3, plain.
- B. Nuts: ASTM A563; Grade; heavy-hex type.
 - 1. Finish: Plain.

C. Washers:

1. ASTM F436.
2. Type 1, circular.
3. Finish: Plain.

D. Compressible-Washer-Type Direct Tension Indicators:

1. ASTM F959.
2. Type: 325.

E. Tension Control Assemblies:

1. ASTM F1852.
2. Type 1, heavy hex head, twist-off type.
3. Furnish with washers and heavy hex nuts.
4. Finish: Unfinished.

F. Anchor Rods:

1. ASTM F1554; Grade 55, weldable ASTM F1554; Grade 36 ASTM F1554; Grade 105, as indicated on drawings.
2. Shape: Straight.
3. Plate Washers: ASTM A36.

G. Threaded Rods:

1. ASTM A36.
2. Finish: Unfinished.

2.3 WELDING MATERIALS

A. Welding Materials:

1. AWS D1.1.
2. Type required for materials being welded.

2.4 FABRICATION

- A. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- B. Fabricate connections for bolt, nut, and washer connectors.
- C. Develop required camber for members.

2.5 FINISHES

- A. Shop-prime structural steel members. Do not prime surfaces that will be field welded or high-strength bolted.
- B. Leave structural steel members unprimed.

C. Galvanizing: ASTM A123; hot-dip galvanize after fabrication.

D. Galvanizing for Bolts, Connectors, and Anchors:

1. Hot-Dip Galvanizing:

- a. Bolts, Nuts, and Washers: ASTM F2329.
- b. Connectors and Anchors: ASTM A153.

2. Mechanical Galvanizing: ASTM B695; Class 50 minimum.

2.6 ACCESSORIES

A. Grout:

- 1. Non-shrink type; premixed compound consisting of nonmetallic aggregate, cement, water-reducing, and plasticizing additives.
- 2. Capable of developing minimum compressive strength of 7,000 psi at 28 days.

B. Shop Primer: SSPC Paint 15, Type 1, red oxide.

C. Touchup Primer: Match shop primer.

D. Touchup Primer for Galvanized Surfaces:

- 1. Comply with ASTM A780.

2.7 SOURCE QUALITY CONTROL

A. Section 01400 - Quality Requirements: Requirements for testing, inspection, and analysis.

B. Testing: Test bolted and welded connections as specified in PART 3 for field quality control tests.

C. Certificate of Compliance: When fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.

- 1. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01700 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify that bearing surfaces are at correct elevation.

C. Verify that anchor rods are set in correct locations and arrangements, with correct exposure for steel attachment.

3.2 PREPARATION

- A. Section 01700 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Furnish templates for installation of anchor rods and embedments in concrete and masonry work.

3.3 ERECTION

- A. Allow for erection loads and for sufficient temporary bracing to maintain structure safe, plumb, and in alignment until completion of erection and installation of permanent bracing.
- B. Field-weld components as indicated on Drawings.
- C. Field-connect members with threaded fasteners; torque to required resistance and snug-tighten for bearing-type connections.
- D. Do not field-cut or alter structural members without approval of Architect/Engineer.
- E. After erection, touch up welds and abrasions to match shop finishes.

3.4 GROUT INSTALLATION

- A. Grout under base plates as specified.
- B. Shim bearing plates and equipment supports to proper elevation, and snug-tighten anchor bolts.
- C. Fill void under bearing surface with grout; install and pack grout to remove air pockets.
- D. Moist-cure grout.
- E. Remove forms after grout is set; trim grout edges to form smooth surface, splayed 45 degrees.
- F. Tighten anchor bolts after grout has cured for a minimum of three days.

3.5 TOLERANCES

- A. Section 01400 - Quality Requirements: Requirements for tolerances.
- B. Maximum Variation from Plumb: 1/4 inch per story, noncumulative.
- C. Maximum Offset from Alignment: 1/4 inch.

3.6 FIELD QUALITY CONTROL

- A. Section 01400 - Quality Requirements: Requirements for inspecting and testing.
- B. Bolted Connections: Inspect according to AISC 303.

1. Visually inspect all bolted connections.
 2. Direct Tension Indicators: Comply with requirements of ASTM F959 and verify that gaps are less than gaps specified in Table 2.
- C. Welding: Inspect welds according to AWS D1.1.
1. Use certified welders, and conduct inspections and tests as required. Record types and locations of defects found in Work. Record work required and performed to correct deficiencies.
 2. Visually inspect all welds.
 3. Ultrasonic Inspection: ASTM E164; perform on each full-penetration weld.
- D. Correct defective bolted connections and welds.

END OF SECTION

STEEL ROOF DECKING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel roof deck and accessories.

1.2 REFERENCES

A. ASTM International:

1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Baked Hardenable.

B. American Welding Society:

1. AWS D1.1 - Structural Welding Code - Steel.

C. Steel Deck Institute:

1. SDI 29 - Design Manual for Composite Decks, Form Decks and Roof Decks.

D. SSPC: The Society for Protective Coatings:

1. SSPC Paint 15 - Steel Joist Shop Paint.

1.3 SUBMITTALS

A. Section 01300 - Submittal Procedures: Submittal requirements.

B. Shop Drawings: Indicate deck plan, support locations, Projections, openings pertinent details, and accessories. Indicated attachment type and spacing for deck ends and side laps

C. Product Data: Submit deck profile characteristics and dimensions, structural properties, finishes.

D. Manufacturer's Installation Instructions: Submit manufacturer's installation instructions.

- E. Manufacturer's Certificates: Certify Products meet or exceed specified requirements.
- F. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ASCE 3 for composite decks.

1.5 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this section with minimum 3 years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 - Product Requirements: Product storage and handling requirements.
 - 1. Cut plastic wrap to encourage ventilation.
 - 2. store deck on dry wood sleepers; slope for positive drainage.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Sheet Steel: ASTM A653 with G60 galvanized coating.
- B. Welding Materials: AWS D1.1.

2.2 FABRICATION

- A. Metal Deck: Sheet steel, configured as follows:
 - 1. Span Design: multiple.
 - 2. Minimum Metal Thickness Excluding Finish: 20 gage.
 - 3. Minimum Section Properties (per foot width): As indicated on drawings.
 - 4. Minimum Allowable Diaphragm Shear: As indicated on drawings.
 - 5. Nominal Height: 1-1/2 inch, fluted profile to SDI WR.
 - 6. Side Joints: lapped, lock seam as required to meet loading requirements on drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01300 - Administrative Requirements: Coordination and project conditions.

3.2 INSTALLATION

- A. Erect metal deck in accordance with SDI Manual.
- B. Bear deck on steel supports with 1-1/2 inch minimum bearing. Align and level.
- C. Weld in accordance with AWS D1.1.
- D. Mechanically fasten male/female side laps as indicated on approved shop drawings.
- E. Weld male/female side laps as indicated on approved shop drawings.
- F. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up prime paint.

3.3 FIELD QUALITY CONTROL

- A. Welding: Inspect welds in accordance with AWS D1.1.

END OF SECTION

BUILDING INSULATION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 07 21 29 – Sprayed Insulation
- B. Section 09 21 16 – Gypsum Board Assemblies

1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this Specification. The publications may be referenced in the text by basic designation only. In case of conflict, the most stringent shall govern:
 - 1. American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) "Handbook of Fundamentals".
 - 2. Underwriter's Laboratories (UL) "Building Materials Directory".
 - 3. ASTM C165 – Test Method for Measuring Compressive Properties of Thermal Insulations.
 - 4. ASTM C177 - Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties utilizing the Guarded Hot-Plate Apparatus.
 - 5. ASTM C272 - Test for Water Absorption of Core Material for Structural Sandwich Construction.
 - 6. ASTM C423 – Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - 7. ASTM C518 - Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties utilizing the Heat Flow Meter Apparatus.
 - 8. ASTM C553 - Specification for Mineral Fiber Blanket Insulation for Commercial and Industrial Applications.
 - 9. ASTM C578 - Specification for Rigid Cellular Polystyrene Thermal Insulation.
 - 10. ASTM C612 - Specification for Mineral Fiber Block and Board Thermal Insulation.
 - 11. ASTM C665 - Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - 12. ASTM C1338- Test Method for Deforming Fungi Resistance of Insulation Materials and Facings.
 - 13. ASTM E84 - Tests for Surface Burning Characteristics of Building Materials.
 - 14. ASTM E96 – Test Methods for Water Vapor Transmission of Materials.
 - 15. ASTM E119 - Fire Tests of Building Construction and Materials.
 - 16. ASTM E136 – Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.
 - 17. ASTM 1621 – Test Method for Compressive Properties of Rigid Cellular Plastics.
 - 18. National Fire Protection Association (NFPA) 285 – Standard Method of Test for Evaluation of Flammability Characteristics of Exterior Non-load – Bearing wall Assemblies Containing Combustible Components.

1.3 SUBMITTALS

- A. Manufacturer's literature including material, composition, fire hazard ratings, and application instructions.

1.4 PRODUCT LABELING

- A. Insulation, or factory sealed packages of the insulation shall be marked by the insulation manufacturers as having the thermal resistance, fire hazard characteristics, water absorption, and compressive strength specified.

1.5 PROTECTION

- A. Store and protect insulation from moisture until permanently enclosed.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply insulation to surfaces, which are frosty, damp, or dirty.

PART 2 - PRODUCTS

2.1 PERFORMANCE CRITERIA

- A. Thermal Resistance Values R:
 - 1. Fill spaces as shown on DRAWINGS and provide the minimum "R" indicated.
 - 2. Indicated "R" shall be for the insulation material by itself per ASHRAE.
- B. Fire Hazard Classification: Insulation materials, including integral facing covers and vapor retarders, shall meet the following ratings when tested per ASTM E-84 (tunnel test). Not required for rigid insulation installed under concrete or earth.
 - a. Fuel contributed: 50.
 - b. Maximum installed flame spread: 25.
 - c. Maximum smoke developed: 450 (50 for insulation left exposed).
 - d. Self-extinguishing.
- C. No added asbestos.
- D. No added formaldehyde.
- E. Blanket fibrous glass insulation: Green Guard Certified.

2.2 RIGID WALL INSULATION

- A. Expanded polystyrene foam insulation (EPS) per ASTM C578, conforming to the following requirements:
 - 1. Rigid board size and thickness per DRAWINGS and as scheduled.
 - 2. Minimum thermal resistance "R" for 1 inch: 4.5 at 25 degrees F. per ASTM C518.
 - 3. Density 1.35 to 1.5 pounds per cubic foot.
 - 4. Minimum compressive resistance: less than 10 percent deformation under 15 psi uniform loading, per ASTM D1621.
 - 5. Maximum moisture absorption is 3 percent by volume after 24-hour immersion per ASTM C272.
 - 6. Minimum vapor permeance: 2 perms per ASTM E96.

2.3 BLANKET (BATT) INSULATION

- A. Kraft paper-facing attachment flanges with fibrous blanket per ASTM C553 or ASTM C665.

2.4 SPRAY FOAM INSULATION

- A. Specified in Section 07 21 29 – Sprayed Insulation.

2.5 ACCESSORIES

- A. As necessary to permanently secure the insulation in place: Tapes, adhesives, and sealants recommended by insulation manufacturers for specified use.
 - 1. Tape:
 - a. 2 3/8-inch-wide acrylic-based pressure-sensitive adhesive tape with polypropylene film, recommended by the manufacturer for construction sealing against air and moisture: 3 mil minimum thick.
 - b. Owens Corning “Bild-R-Tape” or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine DRAWINGS and verify field conditions to receive insulation for defects that will adversely affect the completed installation, and for deviation beyond allowable tolerances.
- B. Installation shall be done only after other trade work in the area is sufficiently complete to prevent subsequent disturbance of insulation.
- C. Beginning of installation shall mean acceptance of the interfacing surfaces as capable of producing an acceptable job.

3.2 PREPARATION

- A. Verify substrates are clean and dry. Remove loose or foreign matter.

3.3 INSTALLATION

- A. Install in accordance with approved submittals and manufacturer's written instructions using necessary primers and accessories.
- B. Install continuously where indicated without voids. Fill spaces completely. Trim and fit closely around structure, openings, conduit, piping, obstructions, and penetrations following the manufacturer's written instructions.
- C. Attach with sufficient tape, adhesives, or mechanical fasteners to permanently anchor insulation.
- D. Batt Insulation and Acoustical Batt Insulation:
 - 1. Attach faced insulation with sufficient compatible tape, adhesives, or mechanical fasteners to permanently anchor insulation following the insulation manufacturer's written instructions.
 - 2. Attach faced insulation flanges to studs.

END OF SECTION

SPRAYED INSULATION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 09 21 16 – Gypsum Board Assemblies

1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this Specification. The publications are referred to in the text by basic designation only. In case of conflict, the most stringent shall apply.
 1. ASTM C177 - Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties utilizing the Guarded Hot-Plate Apparatus.
 2. ASTM C518 - Test Method for Steady-State Thermal Transmission Properties utilizing the heat flow meter apparatus.
 3. ASTM C1029 - Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation.
 4. ASTM D1621 - Test Method for Compressive Properties of Rigid Cellular Plastics.
 5. ASTM D1623 - Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
 6. ASTM D2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
 7. ASTM D2842 - Test Method for Water Absorption of Rigid Cellular Plastics.
 8. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
 9. ASTM E96 - Tests Method for Water Vapor Transmission of Materials.
 10. International Building Code (IBC), Chapter 26.
 11. Underwriters Laboratories Inc (UL) - Fire Resistance Directory.
 12. Intertek Testing Services NA, Inc. (Intertek).

1.3 SYSTEM DESCRIPTION

- A. Spray applied (foamed in place) urethane-isocyanurate rigid foam plastic insulation.

1.4 SUBMITTALS

- A. Product Data: Indicate product descriptions, performance data, materials, recommended use, application instructions, substrate surface preparation, and special curing temperature requirements.
- B. Manufacturer and Installer qualifications.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum of 25 projects like material proposed where specified product was used.
- B. Applicator Qualifications: Minimum of installing 5 similar sprayed insulation systems in Alaska, and must be approved, in writing, by manufacturers for installation of materials installed.
- C. Provide project names, locations, dates, products used, and owner telephone number.

1.6 REGULATORY REQUIREMENTS

- A. Completed installation and barrier coatings shall conform to IBC Chapter 26 including:
 - 1. Foam plastic 75 maximum flame spread rating per ASTM E84.
 - 2. Foam plastic 450 maximum smoke developed per ASTM E84.
 - 3. The interior of the building is separated from foam plastic by a thermal barrier per IBC 2603.4.

1.7 PRE-INSTALLATION MEETING:

- A. Applicator, CONTRACTOR, and CONTRACTING OFFICER shall hold a pre-construction meeting before commencing insulation installation.

1.8 STORAGE AND PROTECTION

- A. Deliver products to the site in the manufacturer's original unopened labeled containers or packages.
- B. Store above freezing in a dry area away from sparks or open flames and following the manufacturer's written recommendations.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Apply insulation, and barrier coatings at ambient temperatures and conditions recommended in writing by the manufacturer and in no case when ambient and substrate temperatures are 50 to 85 degrees F with no dirt, frost, or water on surfaces to be coated. Maintain temperatures for 24 hours before, and during application, and until each coating has cured and dried.
- B. Provide insulated tarps, ventilation, and heat as necessary. Follow the foam and coating manufacturer's instructions not to expose foam to excess heat or open flame.

PART 2 - PRODUCTS

2.1 SPRAY INSULATION

- A. Spray applied (foamed-in-place) 2-component polyurethane/isocyanurate type rigid foam plastic insulation formulated for existing climatic conditions per ASTM C1029.
 - 1. "Heatlok Soy" "200 Plus": www.huntsmanbuildingsolutions.com or approved equal.
- B. Physical and Performance Requirements: Foam shall meet the following minimum in-place requirements when tested following the standard indicated:
 - 1. Thermal Resistance of 1-inch thickness: R6 minimum per ASTM C177. Density 1.5 to 3 pounds per cubic foot (24to 48 kg/m³)
 - 2. Compressive Strength: 15-psi minimum per ASTM D1621.
 - 3. Water Absorption: 0.1 percent maximum per ASTM D2842.
 - 4. Tensile Strength: 40-psi minimum per ASTM D1623.
 - 5. Closed cell content: 90 percent minimum per ASTM D2856.
 - 6. Meet specified "Regulatory Requirements" for flame, fuel, and smoke.
 - 7. Vapor permeance for 1.5-inch thickness: 0.79 per MS per ASTM E96.
- C. Provide primer for substrate following insulation manufacturer instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine Drawings and verify field conditions to receive insulation are securely fastened or adhered, clean, dry, and free of contaminants that will inhibit insulation adhesion.
- B. Verify adjacent work is complete and secure before insulation application.
- C. Beginning of installation shall mean acceptance of substrate and project conditions as capable of producing an acceptable well-adhered job.

3.2 PREPARATION

- A. Clean and dry substrate as recommended in writing by the insulation manufacturer.
- B. Mask and protect adjacent surfaces from overspray and dusting.

3.3 INSULATION APPLICATION

- A. Apply insulation following the manufacturer's instructions and approved submittals. Prime under spray insulation manufacturer recommendations for the substrate.
- B. Apply insulation by spray method in uniform passes not exceeding 1-1/2 inches. Allow the insulation to foam completely before successive layers are applied. Apply full thickness in the same day.
- C. Apply to a minimum cured thickness of 4 inches.
- D. Apply insulation to a uniform monolithic density without soft spongy consistency, free from depressions, pinholes, or voids and securely bonded to the substrate. The foam surface shall be a smooth orange peel or coarse orange peel profile.
 - 1. Unacceptable surface conditions are smooth hard, "popcorn" or "tree bark" surfaces.
 - 2. Remove non-conforming areas and refoam to the acceptable surface as necessary.

3.4 CLEANING

- A. Remove excess materials and debris caused by application as work progresses.
- B. Leave adjacent areas free of overspray and clear of soil caused by insulation and coating application.

END OF SECTION

AIR AND WATER BARRIERS

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 07 41 16 – Insulated Metal Roof Panels

1.2 APPLICABLE PUBLICATIONS

- A. The publications listed form a part of this Specification. The publications are referred to in the text by basic designation only. In case of conflict, the most stringent shall apply.
 1. ASTM C920 – Specification for Elastomeric Joint Sealants
 2. American Society for Testing and Materials (ASTM) ASTM D828 - Test Method for Tensile Properties of Paper and Paperboard Using Constant-Rate-of-Elongation Apparatus.
 3. ASTM D828 – Test Method for Tensile Properties of Paper and Paperboard.
 4. ASTM D882 - Test Method for Tensile Properties of Thin Plastic Sheeting.
 5. ASTM D1970 – Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment For Ice Dam Protection.
 6. ASTM D7349 – Test Method for Determining the Capability of Roofing and Waterproofing Materials to Seal Around Fasteners.
 7. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
 8. ASTM E96 - Test Methods for Water Vapor Transmission of Materials.
 9. ASTM E283 – Test Method for Water Penetration and Air Leakage Through Exterior Windows, Curtain Walls and Doors Underspecified Pressure Differences Across the Specimen.
 10. ASTM E331 – Test Method for Water Penetration of Exterior Windows, Sky Lights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
 11. ASTM E1677 – Specification for Air Retarder Material or System for Low-Rise Framed Building Walls.
 12. ASTM E2178 – Test Method for Air Permeance of Building Materials.
 13. International Building Code (IBC) Chapter 14.
 14. National Fire Protection Association (NFPA) 285 Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Non-load-bearing Wall Assemblies Containing Combustible Components.

1.3 SUBMITTALS

- A. Manufacturer's literature including material, composition, vapor transmission, water resistance, fire hazard ratings, and application instructions, including penetration, lap, and edge details.

PART 2 - PRODUCTS

2.1 SHEET AIR AND WATER BARRIER

- A. Moisture vapor permeable, self-adhering, in continuous sheet recommended by the manufacturer to resist air and liquid water infiltration through exterior walls while allowing moisture vapor to escape.
 1. Air penetration: .04 cubic feet per minute per square foot maximum at 1.57 psf per ASTM E-1677, ASTM E-283 or ASTM E2178.

2. Water resistance: no water penetration when tested for 15 minutes at 15 miles per hour per ASTM E1677, or ASTM E331.
 3. Moisture vapor transmission rate: more than 25 perms per ASTM E-96.
 4. Tensile Strength: 25 pounds per inch minimum per ASTM D-882 or ASTM D828.
 5. Flame spread: Class A 25 maximum per ASTM E-84.
 6. Smoke development: Class A 450 density maximum per ASTM E-84.
 7. Nail Sealability: Pass per ASTM D1970.
- B. Acceptable Manufacturers subject to meeting specified requirements:
1. VaproShield "Slopesield"– www.vaproshield.com
 2. Henry "Blueskin VP160" – www.henry.com
 3. W.R. Meadows "Air Shield SMP" www.wrmeadows.com

2.2 ACCESSORIES

- A. Attach and seal with primers, adhesives, mastics, tapes, through-wall flashing membrane, opening corners, sealants, and fasteners as recommended by the air barrier manufacturer and as follows:
1. Polyethylene or polypropylene tape, with water-resistant pressure sensitive adhesive recommended for cold temperature application to plastic sheet and metal: Owens Corning. "Bild-R-Tape"; Proscoc "R-Guard" Mastic or approved.
- B. Adhesive: recommended for cold temperature application to plastic and metal.
- C. Coverboard on Ribbed Steel Decking:
1. 5/8-inch fire-resistant Type "X" gypsum sheathing with silicone-treated moisture-resistant core and fiberglass mat water-repellent facing (No paper facing) and edges per ASTM C1177. Acceptable manufacturer: Georgia Pacific "Dens Deck Prime" or approved.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine Drawing Details and field conditions to receive work for defects that will adversely affect the completed installation and for deviations beyond allowable tolerances.
- B. Substrate surfaces shall be free of sharp projections or holes over which the air barrier sheet can easily be applied without tearing or puncturing.
- C. Verify that substrate work by other trades is complete and ready for the air barrier.
- D. Beginning of installation shall mean acceptance of the existing conditions as capable of producing an acceptable job.

3.2 INSTALLATION

- A. Install gypsum coverboard over an existing structural steel deck with corrosion-resistant screws 24" oc. Lay boards with tight joints at raised deck flutes. Stagger end joints 12".
- B. Install sheet barrier horizontally. Completed installation shall be continuous without gaps, holes, or tears following the air barrier manufacturer's instructions for conditions of use and these specifications.

- C. Layout air barrier to provide a single sheet where possible with a minimum number of joints. Allow enough fullness or pleats at corners and offsets so that the finish material installation does not tear the air barrier.
- D. Lap sheet air barrier joint seams four inches minimum, adhere, or tape to the backing, and seal continuously with tape. Lap top layer over the bottom to shed water.
- E. Penetrations: Seal the air barrier continuously around all structural, mechanical, electrical, and other penetrations with tape and sealant. Tape an extra separate sheet of air barrier over as necessary.
- F. Attachment: Tape, primer, and adhesives as recommended by the manufacturer.
- G. Repair: All punctures and tears by patching with extra lapping material twelve inches minimum and sheet taping, just before final cover-up.

3.3 AIR BARRIER SCHEDULE

- A. Install barrier over gypsum coverboard over structural roof deck – under-insulated metal roof panels.

END OF SECTION

INSULATED METAL ROOF PANELS

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 07 72 53 – Roof Snow Guard System
- B. Section 07 92 00 - Joint Sealants

1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this Specification. The publications are referred to in the text by basic designation only. In case of conflict, the most stringent shall apply.
 - 1. ASTM A653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process.
 - 2. ASTM A792 – Specifications for Sheet Steel, 55 Aluminum – Zinc Alloy – Coated by the Hot-Dip Process.
 - 3. ASTM B117 – Practice for Operating Salt Spray (Fog) Apparatus.
 - 4. ASTM C518 - Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties using Heat Flow Meter Apparatus.
 - 5. ASTM D523 – Test Method for Specular Gloss.
 - 6. ASTM D822 – Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
 - 7. ASTM D968 - Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.
 - 8. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
 - 9. ASTM D2247 - Practice for Testing Water Resistance of Coating in 100 PerCent Relative Humidity.
 - 10. ASTM D3363 - Test Method for Film Hardness by Pencil Test.
 - 11. ASTM D3794 - Practice for Testing Coil Coatings.
 - 12. ASTM D4145 – Test Method for Coating Flexibility of Prepainted Sheet.
 - 13. ASTM D4214 – Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
 - 14. ASTM D5324 – Guide to Testing Water-Borne Architectural Coatings.
 - 15. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
 - 16. ASTM E283 – Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - 17. ASTM E331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - 18. ASTM E1646 – Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.
 - 19. ASTM E1680 – Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel System.
 - 20. International Building Code (IBC).
 - 21. NFPA 285 – Test Method of Test for Evaluation of Flammability Characteristics of Exterior Non-Bearing Wall Assemblies Containing Combustible Components.
 - 22. NFPA 286 – Standard Method of Fire Test for Evaluation Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

23. FM 4880 – American National Standard Evaluating Insulated Wall or Wall and Roof/Ceiling Assemblies, Plastic Interior Finish Materials, Plastic Exterior Building Panels, Wall/Ceiling Coating Systems, Interior and Exterior Finish Systems.
24. UL 1715 – Fire Test of Interior Finish Material.
25. American Architectural Manufacturers Association (AAMA) 621 – Voluntary Specifications for High-Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum Coated Steel Substrates.

1.3 PANEL PERFORMANCE REQUIREMENTS

- A. Fire Characteristics: IBC 2603 foam plastic compliant without sprinklers:
 1. Based on large-scale tests such as NFPA 286, F.M.4880, U.L. 1040, or U.L. 1715.
- B. Snow and Wind Loads: Size components and screw attach to the structure to resist loads indicated on Structural Drawings without causing detrimental effects to the panel system.
 1. Coordinate with the structural support system.
 2. Size attachment screws with a minimum safety factor of 3.
- C. Thermal Resistance: Provide R42 minimum when tested at 35 degrees Fahrenheit per ASTM C518.
- D. Minimum Thickness: 6 inches.
- E. Thermal Movement: provide for expansion and contraction with surface temperatures between minus 20 degrees Fahrenheit and 125 degrees Fahrenheit without causing buckling, cracking of finish, or failure of joints or fasteners.
- F. Water Penetration: IBC 1402 compliant: no uncontrolled water penetration to the inside of the building when panel joints are tested per ASTM E331 or E1646 at 20 psf and 5 gallons of water per square foot for 2 hours.
- G. Air Infiltration: 0.01 cfm per square foot maximum when tested at 12 psf per ASTM E283.

1.4 SUBMITTALS

- A. Shop Drawings, Calculations, and Product Data to Illustrate:
 1. Conformance with Performance Requirements:
 - a. Wind loads.
 - b. Snow loads.
 2. Installation Layout and Details:
 - a. Layout of Panels: Indicate the size of panels, joints, and edges at adjacent different materials.
 - b. Details of flashing, shapes, and sizes.
 - c. Location of closure strips and sealant.
 - d. Location and flashing details at penetrations.
 3. Fasteners:
 - a. Manufacturer's rated withdrawal value for screws.
 - b. Type, corrosion resistance, size, location, and spacing to be used for each different condition.
 - c. Screw spacing and locations at edges, joints, and field. Attachment of perimeter flashing.
 4. Joints:
 - a. Inter-relationship of components and flashing.

- b. Sealant and sealant tape specifications.
 5. Panel fire certification, labels, and test data to verify IBC 2603 conformance.
 6. Coating Specifications.
- B. Samples:
1. Minimum 12-inch long; sample of two panels, illustrating joint system.
 2. Minimum 6 by 6-inch coating samples of selected finish color.
- C. Certificates:
1. Manufacturer's certification of conformance for experience qualifications and performance requirements.
 2. Installer qualifications and approval by the manufacturer.
 3. Independent test lab verifying thermal performance.
- D. Warranties:
1. Panel Manufacturer.
 2. Paint Manufacturer.

1.5 QUALITY ASSURANCE

- A. Panel Manufacturer Qualifications:
1. Provide one of the acceptable manufacturers or provide a minimum of 25 similar successful installations manufacturing concealed fastener metal-faced plastic foam insulated panels.
- B. Installer Qualifications:
1. Approval in writing by the panel manufacturer.
- C. Pre-Installation Conference: Attended by CONTRACTOR, installer, and OWNER'S Representative.
1. Schedule in advance of the start of work and when at least part of the work is ready for panel installation.
 2. Bring approved submittals and samples of panel materials to the conference.

1.6 MOCK UP

- A. Before proceeding with work install 4 adjacent panels to illustrate panel flatness, anchorage, and joint configuration.
- B. Accepted mockup panels may remain and serve as a standard for the remainder of the work.
- C. Locate where mutually agreed upon with OWNER.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Installation of Joints and Sealants:
1. Temperature between 25- and 55 degrees F.
 2. Surfaces free of rain, snow, or frost.

1.8 WARRANTIES

- A. Panels: Panel Manufacturer's 2-year warranty that panels will not delaminate, rupture, or fail structurally.

- B. Paint Finish: Panel Paint Manufacturer's 10-year warranty that panels will be free of excessive color fade, chalking, and have no peeling or cracking.
- C. Installer: 2-year warranty that panels will not show water on inside panel surfaces.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to meeting specified criteria:
 - 1. Kingspan: <http://www.kingspanpanels.us>
 - 2. Centria: <http://www.centria.com>
 - 3. Metlspan: <http://www.metlspan.com>
 - 4. All Weather: <http://www.awipanel.com>
 - 5. MBCI: www.mbc.com

2.2 PANELS

- A. General: Panels shall be sandwich type complying with Performance Requirements and recommended by the manufacturer for conditions of use indicated, consisting of a core of polyurethane/isocyanurate plastic insulation foamed between interior and exterior facings of sheet steel: G-90 galvanized, Galvalume, steel conforming to ASTM653 or ASTM792: interior 26 gauge, exterior 24 gauge minimum with stipple embossed texture.
- B. No through metal connections between panel faces.
 - 1. Panels shall be one-piece continuous length unless field joints are panel manufacturer factory cut and provided with manufacturer backer plates following approved submittals.
 - 2. Minimum of 20 feet panel length.
 - 3. Panel side joints offset interlocking without exposed sealant.
 - 4. Raised standing side lap seam suitable for clamp-type nonpenetration snow guard attachment equal to S-5 clamp.
 - 5. Anchoring plates and fasteners concealed from view with panels installed.
 - 6. Panel manufacturer cut back panel ends for eave flashing.
- C. Install attachment screws through clips into the building structure to meet performance requirements but not over 5 feet spacing.

2.3 PANEL COATING:

- A. Exterior Surface: factory coil applied: Polyvinylidene fluoride, (PVDF) coating system with minimum 70 percent resins complying with the following:
 - 1. Total Coating Thickness: minimum 1.7 mil: Primer 1.0 mil and surface finish 0.7-0.8 mil.
 - 2. Gloss: low less than 19 at 60 degrees per ASTM D523.
 - 3. Weathering: no checking, blistering, or adhesion loss when tested for 2,000 hours per ASTM D822.
 - 4. Chalking: no chalk greater than No. 8 rating when tested for 2000 hours per ASTM D4214.
 - 5. Fading: color change shall not exceed 5 units when tested for 2,000 hours per ASTM D2244.
 - 6. Humidity resistance: less than 5 percent of No. 8 blisters when tested for 2,000 hours in 100 percent humidity at 100 degrees F per ASTM D2247.

7. Salt Spray resistance: no more than 1/16-inch creep from scribe and less than 5 percent No. 8 blisters when tested for 750 hours in 5 percent salt fog at 95 degrees F per ASTM B117.
8. Flexibility: no rupture of the coating when bent 180 degrees per ASTM D4145.
9. Hardness: HB pencil hardness: no film failure when tested per ASTM D3363.
10. Abrasion Resistance: withstand 50 liters of falling sand before the appearance of base metal per ASTM D968.
11. Panel Exterior Color: One of the manufacturer's standard colors will be selected. Match for associated flashing and trim.
12. Panel Interior Coating: a factory-applied primer with silicone polyester: one mil thick white color.

2.4 ATTACHMENT

- A. Screws recommended by the panel manufacturer to meet Performance Requirements, but not smaller than Number 14 (1/4 inch) diameter stainless steel or carbon steel corrosion resistant coated to resist 1000 hours of salt spray per ASTM B117 with no more than 5 percent red rust appearing on head or shank. Screw threads shall completely penetrate materials to be joined but shall not extend more than 1.5 inches through the inside surface.
 1. Exposed Fasteners: for flashing trim only: Number 14 (1/4 inch) diameter screws preassembled with a 3/4-inch diameter 18-gauge tapered lip stainless steel washer bonded to an EPDM sealing washer. Factory paint heads and washers to match adjacent panel finish.
 2. Minimum pullout value 400 pounds when tested in predrilled pilot holes through 16-gauge thick, ASTM A653 steel.
 3. Rivets or nails are not permitted.
- B. Panel attachment clips by Panel Manufacturer shall meet Performance Requirements.

2.5 FLASHING AND TRIM

- A. Provide 24-gauge steel flashing trim at perimeter edges of the panel system, ridges, and at the interface with adjacent different materials, corners, and penetrations.
 1. Match panel finish and color.
 2. Provide a flashing inset at any exposed panel edges to cover the foam and provide a water shedding drip edge.
- B. Spray foam voids at ridges, corners, and penetrations: 1.5 to 3-pound density polyurethane. Cover any exposed foam with metal.
- C. Provide panel edge trim as recommended by the panel manufacturer for complete weathertight installation per the Performance Requirements and as specified.
- D. Rectangular Penetrations and Pipes over 6-inch diameter: Single piece welded watertight penetration flashing with 24-gauge ice deflector cricket, formed to fit panel profile.
- E. Round Penetrations up to 6-inch diameter (Pipe Flashing): EPDM rubber "Dektite" "Sealtite" or "Master Flash" Type recommended by flashing manufacturer for metal roof pipe penetration flashing, centered in roofing panel with stainless steel clamp band.
 1. Over 6 inches in diameter use flashing specified for rectangular penetration.
 2. Provide ice deflector cricket, snow guard, or ridge within 4-feet upslope of penetration.

2.6 GASKETS, SEALANTS, AND CLOSURES

- A. Place seal near the interior face of panel joints to act as a vapor retarder.
- B. Seal panel side laps, end laps, and flashings with pressure-sensitive butyl sealant tape or continuous 1/4-inch non-skinning butyl sealant bead.
- C. Closures: resilient EPDM or closed cell foam closures or approved equal matching the panel profile.
- D. Exposed sealant: single component non-sag polyurethane type per ASTM C920, with closed cell polyethylene backer rod.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrate, drawing details, and conditions under which panels will be installed.
- B. Verify field measurements. Modify work as required for fit.
- C. Beginning installation shall mean acceptance of existing conditions as capable of producing an acceptable job.

3.2 DEMOLITION

- A. Remove existing roofing down to the top of the existing structural deck.
- B. Remove existing wall surfaces as noted on DRAWINGS.

3.3 INSTALLATION OF INSULATED PANELS

- A. Install over air-water barrier underlayment following approved shop drawings and manufacturer's written instructions to meet Performance Requirements.
- B. Erect panels with horizontal lines straight and level and vertical lines plumb.
- C. Locate panel attach screws 6-inches maximum from panel ends and as necessary to meet Performance Requirements. Provide panel fix point to resist snow down drag.
- D. Screws attach at each structural furring, girt, purlin, or edge member.
- E. Install side lap tape sealant at panel side lap and install extra sealant over and under attachment clips. Apply continuous sealant bead along inner panel facing joints to provide vapor retarder. Replace any factory-applied sealant and gasket that is damaged or lost resiliency.
- F. Secure panels without warp or deflection.
- G. Fill any voids around the edges and penetrations with spray foam insulation.
- H. Fill any voids between the roof and wall panels and at the ridge with spray foam insulation.

3.4 INSTALLATION OF FLASHINGS AND ACCESSORIES

- A. Conform to Drawings, panel manufacturer instructions, and approved Shop Drawings. Lap flashing joints to drain water to the exterior.
- B. Flashing Intersecting Panel Ribs: Match panel profile as needed for weather-tight closure.
- C. Install closures set in a continuous bead of sealant with a screw through the center.
- D. Screw flashing spacing 10 inches maximum, and 2 inches maximum from edges.
- E. Seal flashing joints in lapped bed of 1/4 inch sealant bead.
- F. Seal moving flashing joints with 2 rows of sealant tape.
- G. Install snow guards per Section 07 72 53 – Roof Snow Guards.

3.5 TOLERANCES

- A. Alignment: 1/4 inch in 20 feet, maximum variation from vertical and level.
- B. 1/8-inch maximum variation from adjacent panel surface.
- C. Panel flatness: 1/8-inch plus or minus in 5-feet.
- D. No obvious “oil canning” when viewed from 10 feet.

3.6 ADJUSTING AND CLEANING

- A. Remove cuttings and metal shavings and protective shipping coatings from finished surfaces at the end of each day. Remove stains immediately.
- B. Paint minor scratches and abrasions with panel manufacturer approved paint immediately after observance, using smallest brush practical. Spray touch-up not permitted.

END OF SECTION

METAL SIDING

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 07 27 10 - Air and Water Barriers
- B. Section 07 62 10 - Flashing and Trim
- C. Section 07 92 00 - Joint Sealants

1.2 APPLICABLE PUBLICATIONS

- A. Applicable Publications: The publications listed below form a part of this Specification. The publications are referred to in the text by basic designation only. In case of conflict, the most stringent shall apply.
 - 1. ASTM A653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM A792 - Specification for Steel Sheet, 55 Aluminum-Zinc Alloy-Coated by the Hot Dip Process.
 - 3. ASTM A924 - Specification for General Requirements for Steel Sheet, Metallic Coated by the Hot-Dip Process.
 - 4. ASTM B117 - Practice for Operating Salt Spray (Fog) Apparatus.
 - 5. ASTM C920 - Specification for Elastomeric Joint Sealants
 - 6. ASTM D4214 – Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
 - 7. ASTM D522 - Test Methods for Mandrel Bend Test of Attached Organic Coatings.
 - 8. ASTM D523 – Test Method for Specular Gloss
 - 9. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
 - 10. ASTM D2247 - Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
 - 11. ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
 - 12. ASTM D3363 - Test Method for Film Hardness by Pencil Test.
 - 13. ASTM D4145 - Test Method for Coating Flexibility of Prepainted Sheet.
 - 14. ASTM D5796 – Test Method for Measurement of Dry Film Thickness of Thin-Film Coil-Coated Systems by Destructive Means Using a Boring Device
 - 15. ASTM E84 – Test Method for Surface Burning Characteristics of Building Materials.
 - 16. ASTM G154 - Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Material.
 - 17. SMACNA - Sheet Metal and Air Conditioning Contractors of America Architectural Sheet Metal Manual.
 - 18. International Building Code (IBC).

1.3 SUBMITTALS

- A. Shop Drawings and Product Data to Illustrate:
 - 1. Installation Layout and Details:
 - a. Details of flashing and metal closures.
 - b. Location and flashing details at penetrations.

2. Fasteners:
 - a. Type, corrosion resistance, spacing, and size to be used for each condition.
 - b. Attachment of exposed perimeter flashing.
 - c. Manufacturer's rated withdrawal value for fasteners, into substrates indicated on DRAWINGS.
3. Joints:
 - a. Inter-relationship of components.

B. Manufacturer's qualifications.

C. Warranties

1.4 QUALITY ASSURANCE

A. Panel Manufacturer Qualifications:

1. Minimum 25 successful jobs manufacturing formed wall panels similar to that proposed.

1.5 WARRANTIES

- A. Paint Finish: Manufacturer's 10-year minimum warranty covering color fade, chalking, peeling, cracking, or blistering.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Subject to meeting specification requirements:

1. AEP Span: www.aepspan.com
2. Metal Sales: <http://www.metalsales.us.com>
3. Morin: www.morincorp.com
4. Bridger Steel: www.bridgersteel.com
5. Magic Metals: www.magicmetals.com

2.2 SHEET STEEL

- A. Sheet steel: ASTM A924 or A792 33,000-psi minimum yield, tension leveled with base metal protective coating: zincalume or galvalume (45 percent zinc, 55 percent aluminum alloy) 1.9 mil thick per ASTM A792 or G90 or galvanized per ASTM A653.

2.3 SIDING PANELS

- A. Steel factory painted 36-inch panels, 3/4-INCH high ribs at 9-inch maximum spacing for lap edge joints like AEP Span "U-Panel".
1. Minimum thickness: 26 gauge.

2.4 FACTORY-COATED PAINT FINISH

- A. Corrosion resistant prime both sides; complete finish exposed side equal to Kynar 500 or Hylar 5000.
- B. Coating Thickness: One mil (Primer 0.52 mil plus finish 0.8 mil per ASTM D5796).

- C. Gloss: low to medium: 15 to 25 percent per ASTM D523.
- D. Weathering – no checking, blistering, or adhesion loss when tested for 2,000 hours per ASTM G154.
- E. Chalk Resistance: no chalk greater than No. 8 rating when tested for 2,000 hours per ASTM D4214.
- F. Salt Spray – no more than 1/16 inch creep or blisters from scribe when tested for 1,000 hours in 5 percent salt fog at 95 degrees F. per ASTM B117.
- G. Flexibility – no cracking of coating when bent per ASTM D4145 or ASTM D522.
- H. Impact Resistance - no fracture after the reverse impact of 80-inch pounds per ASTM D2794.
- I. Hardness: F to 2H pencil per ASTM D3363.
- J. Flame Test: Class A per ASTM E84.
- K. One of the manufacturer's standard colors will be selected.

2.5 METAL FLASHING AND TRIM

- A. As indicated on the DRAWINGS and for exposed perimeter edges and around penetrations and recommended by the panel manufacturer for a complete weathertight installation.
- B. Accurately formed from smooth material per SMACNA recommended practices and approved shop drawings.
- C. 24-gauge zincalume or galvalume steel.
- D. Perimeter edges: 2-inch J-trim with hem edges.
- E. Bottom starter strips.
- F. Provide the same coating finish and color as adjacent panels.

2.6 FASTENERS

- A. Screws recommended by the siding manufacturer and stainless steel or carbon steel corrosion-resistant coated to resist 1000 hours of salt spray per ASTM B117 with no more than 5 percent red rust appearing on the head or shank.
 - 1. Siding attachment screws minimum number 1/4 x 4-inch length for siding fasteners into steel furring.
- B. Exposed flashing fasteners: Number 12 0.21-inch diameter screws preassembled with 5/8-inch diameter 18 gauge tapered lip stainless steel washer bonded to an EPDM sealing washer. Factory paint heads and washers to match the siding finish.
- C. Nails or rivets are not permitted.

- D. Minimum pullout value 400 pounds when tested in predrilled pilot holes through 16-gauge ASTM A653 steel.

2.7 AIR BARRIER

- A. As specified in 07 27 10 Air and Water Barriers.

2.8 SEALANT SYSTEM

- A. Single component non-sag urethane or silicone, per AESTM C920.
- B. Sealant backer rod: non-gassing polyethylene foam filler rod recommended by Sealant manufacturer.
- C. Color: Standard color nearest match to panels.

2.9 TAPE SEALANT

- A. Resilient polyethylene foam with self-stick adhesive, continuous 3/8-inch minimum width, and 1/4-inch thickness.
- B. 3/8-inch minimum width and 1/4-inch minimum thickness.
- C. Schnee-Moorehead Company; Gaska Tape Inc. or substitutions per Section 01 60 00-Product Requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrate, DRAWING Details, and conditions under which siding will be installed.
- B. Verify field measurements. Modify work as required for accurate fit.
- C. Beginning installation shall mean acceptance of existing conditions as capable of producing an acceptable job.

3.2 SIDING INSTALLATION

- A. Install as indicated, following approved shop drawings and manufacturer's written instructions over the air barrier.
- B. Cut and fit members neatly to fit into edge trim and around penetrations. Lap upper members over lower to shed water.
- C. Secure panels without warp or deflection. Do not overdrive fasteners.

3.3 INSTALLATION OF FLASHINGS AND ACCESSORIES

- A. Conform to panel manufacturer recommendations and approved shop drawings.
- B. Provide 2-inch lapped joints to shed water with thermal expansion space.

- C. Flashing fastener: even spacing 12-inch maximum and 2-inch maximum from edges.
- D. Provide thermal movement space around penetration spaces. Seal with continuous sealant or sealant tape.
- E. Seal flashing joints in a lapped bed of sealant or sealant tape.

3.4 TOLERANCES

- A. Panel Flatness: ¼-inch out of plane from panel edges.
- B. Joint Around windows and doors: Evenly space 1/8-to-1/4" gap.

3.5 CLEANING

- A. Remove cuttings and metal shavings from finished surfaces at the end of each day. Remove stains and excess sealant immediately.
- B. Repair minor scratches and abrasions with manufacturer provided paint, using smallest brush practical. Spray touch-up not permitted.

END OF SECTION

FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 07 41 16 – Insulated Metal Roof Panels
- B. Section 07 92 00 - Joint Sealants
- C. Section 08 54 13 – Fiberglass Windows
- D. Section 09 91 00 – Painting

1.2 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this Specification. Publications may be referenced in the text by basic reference only. In case of conflict, the most stringent shall govern.
 - 1. American Society for Testing Materials (ASTM) specific references as noted.
 - 2. ASTM A653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 3. ASTM B117 – Practice for Operating Salt Spray (Fog) Apparatus.
 - 4. ASTM C920 - Specification for Elastomeric Joint Sealant.
 - 5. ASTM D146 - Test Methods for Sampling and Testing Bitumen-Saturated Felts and Fabrics Used in Roofing and Waterproofing.
 - 6. ASTM D779 – Standard Test Method for Water Resistance of Paper, Paperboard, and other sheet materials by Dry Indicator Method
 - 7. ASTM D828 – Tensile Properties of paper and paperboard using Constant-Rate of Elongation Apparatus.
 - 8. ASTM D1004 - Test Methods for Initial Tear Resistance of Plastic Film and Sheeting.
 - 9. ASTM D1876 - Test Methods for Peel Resistance of Adhesives.
 - 10. ASTM D1970 - Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
 - 11. Sheet Metal and Air Condition Contractor's National Association (SMACNA) "Architectural Sheet Metal Manual".
 - 12. National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual.
 - 13. American Welding Society (AWS) "Code for Welding in Building Construction".
 - 14. Society for Protective Coatings (SSPC) Systems and Specifications.
 - 15. International Building Code (IBC).
 - 16. American Architectural Manufacturers Association (AAMA) 621 – Voluntary Specifications for High-Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized and Zinc-Aluminum Coated Steel Substrates.
- B. ASTM G87 – Standard Practice for conducting Moist SO2 test.

1.3 SUBMITTALS

- A. Shop Drawings and Manufacturer's Literature: Including dimensions, materials, joints, fasteners, anchorage, installation recommendations, details, and location in complete work if the work proposed differs from Contract DRAWINGS.

PART 2 - PRODUCTS

2.1 GALVANNEALED STEEL SHEET

- A. American Society for Testing and Materials ASTM A653 cold rolled steel sheet, lock-forming quality. Hot-dip Galvannealed zinc coating on both sides of at least 0.90 ounces per square foot total. (G90).
- B. Minimum thickness 24-gage except for unbacked spans over 12-inches 20-gage unless indicated otherwise. Special thickness per DRAWING details. Anchor clips and hook strips 20-gage.

2.2 FLEXIBLE RUBBER-ASPHALT FLASHING

- A. Pre-manufactured, elastomeric, self-adhering, self-sealing sheet membrane waterproofing composed of high-strength polyethylene sheet plastic bonded to rubberized asphalt per ASTM D1970 recommended by the manufacturer for application as concealed flashing meeting the following requirements.
 - 1. Total thickness: 40 mil minimum.
 - 2. Maximum load at break: 25 pounds per inch per ASTM D1970.
 - 3. Elongation at break, asphalt: 10 percent minimum per ASTM D1970.
 - 4. Low-Temperature Flexibility: 180-degree bend over 1-inch mandrel at minus 20 degrees F without cracking per ASTM D1970.
 - 5. Overall adhesion between Plywood and adjacent membrane at 40 degrees F: 3.0 pound per inch width minimum per ASTM D1970.
 - 6. Sealability around nail: pass per ASTM D1970.
 - 7. Removable release paper.
 - 8. Primer: as recommended by the underlayment manufacturer for conditions of use.
- B. Approved manufacturer subject to meeting specified criteria:
 - 1. W.R. Grace "Bituthene Ice and Water Shield" roof flashing or "Perm-A-Barrier wall flashing" by W. R. Grace, www.wrgrace.com,
 - 2. "CCW-705 TWF" - www.carlisleccw.com
 - 3. Hohman & Barnard "Flex-Flash" by, www-h-b.com,
 - 4. Fortifiber Building Systems "Moistop Next" by, <https://henry.com/residential-and-light-commercial/>
- C. Substitutions per General Conditions.

2.3 LIQUID APPLIED MASTIC FLASHING

- A. Liquid applied mastic recommended by the manufacturer for wall opening penetrations, and self-sealing around fasteners.
- B. Approved manufacturers: subject to meeting specified criteria:
 - 1. Dow Corning "Liquid Armor", www.dowcorning.com
 - 2. Prosoco "R-Guard", www.prosoco.com
 - 3. Dupont "TyvekFluid Applied Flashing", www.dupont.com

2.4 FASTENERS

- A. Number 14 (1/4 inch) stainless steel or corrosion and abrasion-resistant coated carbon steel resistant to 1000 hours salt spray per ASTM B117 or 15 cycles per ASTM G87 – Kesternich

Cabinet Testing; testing with 15 percent maximum red rust, and no coating blistering or cracking on head or shank.

- B. Exposed fasteners: Number 14 (1/4 inch) diameter screws preassembled with a 3/4-inch diameter 18-gage tapered lip stainless steel washer bonded to an EPDM sealing gasket washer. Factory-painted heads to match the adjacent metal color.
- C. Use round or pan head, Phillips screws for concealed work.
- D. Nails and pop rivets are not permitted.
- E. Screws shall penetrate metal substrate 1/2 inch or penetrate wood substrate 1-1/2 inches.

2.5 ACCESSORIES-ATTACHMENTS

- A. Primers, clips, hook strips, angles, cover plates, inserts, and other accessories, as necessary for secure attachment shall be the same material as flashing and per SMACNA and NRCA recommendations. Fabricate anchor clips and hook strips one gauge thicker than the attached flashing.
- B. Reglets: Surface mounted type, 5 inches high minimum, for continuous sealant fillet, Fry type SM or equal substitution.

2.6 SEALANTS

- A. Single component silicone or urethane per ASTM C920.
 - 1. Tape sealant may be used for straight lap joints: 50 percent butyl, 1/4-to-1/2-inch width, and thickness.
- B. Color: Standard color nearest match to flashing finish color for exposed sealants.

2.7 PAINT

- A. Shop prime and shop finish paint exposed surfaces.
 - 1. One coat of zinc-base topcoat compatible primer.
 - 2. Two coats of urethane enamel, semi-gloss.
- B. Factory-coated 70 percent Kynar enamel, AAMA 621 finish is acceptable in place of shop paint.

2.8 METAL FABRICATION

- A. Fabricate per approved submittals and the best commercial practice of SMACNA and NRCA. Form sections square, true, and accurate to size, free from distortion and to fit the substrate.
- B. Fabricate sheets or panels in the longest lengths practical, true to details, and free of dents, scratches, and tool marks. Make allowances for thermal expansion-contraction at joints.
- C. Cross break as necessary to prevent "oil canning". Form lines and edges straight and neat. Form bent-metal corners to the smallest radius possible without causing grain separation. Roll exposed edges back on the underside to form a folded, hemmed edge, 1/2 inch minimum (3/4 inch minimum to engage hold down). Slope exposed vertical bottom edges 45 degrees to form a drip.
- D. Welding shall be per AWS for the type of weld and material. Grind exposed welds smooth

and flush. Coat welds and bare metal abrasions in galvanized steel with SSPC 20 zinc-rich epoxy primer paint.

- E. Joints shall be weathertight and have provisions for expansion and contraction. Lap joints and corners are watertight. Lap in the direction of water flow. Provide slotted holes at exposed gasketed screws.

2.9 SHOP CLEANING AND PAINTING

- A. Clean metal before painting by "solvent cleaning" SP-1, followed by an acid etch and "hand cleaning" SP-2 per SSPC.
- B. Shop paint 1 primer coat and 2 finish coats per finish paint manufacturer's instructions.
- C. Factory Coil paints PVDR coating per AAMA 621 is acceptable in lieu of shop paint.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the DRAWING details and field conditions to receive the work for defects that will adversely affect the completed work and for deviations beyond allowable tolerances.
- B. Beginning of installation shall mean acceptance of existing conditions as capable of producing an acceptable job.

3.2 DISSIMILAR MATERIALS

- A. Steel contacting aluminum, concrete, masonry, or treated wood shall have contact surfaces separated by a heavy coat of bituminous paint, 40 mil self-adhering rubber sheet, or by non-absorptive tape.
- B. Separation materials shall be trimmed to not be visible in exposed completed work.

3.3 INSTALLATION

- A. Install all flashings following the best commercial practice of SMACNA, NRCA, and under approved submittals, plumb, level, or alignment shown on the DRAWINGS.
- B. Joints shall be weathertight and have provisions for expansion and contraction. Lap to shed water flow outside.
 - 1. Lap flashing over window head and sill.
 - 2. Lap metal flashing 4-inch minimum with sealant tape to shed water.
 - 3. Extend flashing 8-inch minimum above roofing.
- C. Provide roofing edge flashing and parapet flashing joints with a 5-inch wide inside cover plate set in sealant and gasket head screws on one side allowing ½-inch movement space between flashing: or overlap 4-inch minimum in sealant with gasket head screws along open seams 4-inch on center.
- D. Cut components neatly to fit against the adjacent member.
- E. Field cut members exposed in the completed work so that the finish is not damaged. Leave

no exposed sharp edges.

- F. Length of screws shall be sufficient to fully penetrate metal or plywood, or 1 1/2-inch minimum into solid backing.
- G. Cutting or drilling of building structural components shall not be permitted unless approved by ARCHITECT in writing.
- H. Touch-up steel with paint primer and finish coat equal to adjacent panel finish coating at bare metal abrasions.
- I. Install liquid-applied mastic flashing in and around wall penetrations including windows.

3.4 ANCHORAGE AND ATTACHMENT

- A. Spacing and quantity of anchor fasteners as indicated and required to develop permanent weather-tight joints on exterior work.
- B. Maximum spacing of exposed fasteners shall be 12 inches evenly spaced within 1-1/2 inches of panel edges unless closer spacing is indicated.

3.5 SEALANT APPLICATION

- A. As recommended by sealant manufacturer-approved submittals, to provide permanent, weathertight joints. Set lapped seams in sealant bed or sealant tape.
- B. Joints shall be sealed continuously against the weather and have provisions for expansion and contraction.
- C. Seal moving lap flashing joints with 2 rows of sealant tape.

END OF SECTION

ROOF SNOW GUARD SYSTEM

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 07 41 16 – Insulated Metal Roof Panels

1.2 APPLICABLE PUBLICATIONS

- A. The publications listed form a part of this Specification. The publications are referred to in the text by basic designation only. In case of conflict, the most stringent shall apply.
 1. ASTM A653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 2. ASTM A792 - Specification for Steel Sheet, 55 percent Aluminum-Zinc Alloy-Coated by Hot-Dip Process.
 3. ASTM B85 Specification for Aluminum–Alloy Die Castings.
 4. ASTM B117 - Practice for Operating Salt Spray (Fog) Apparatus.
 5. ASTM B221 – Specifications for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
 6. International Building Code (IBC), Chapter 16.
 7. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
 8. Metal Construction Association (MCA) – Metal Roof Design for Cold Climates.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide Snow Guard Attachment to the standing seam metal roof as follows:
 1. Clamp onto each roof seam - No paint damage and only minor dimpling of panel ribs.
 2. No penetrations through roof seams or panels.
 3. No sealants or adhesives.
 4. Roofing paint & weather-tight warranties approved.
 5. Break away allowing excess snow-ice to not damage metal roofing.
- B. Loading: 5 percent less than the downslope vector load used for the metal roofing. Reference structural Drawings. Provide load test data.
- C. If the snow load exceeds the design load per clamp; the clamp shall break away without roof damage.

1.4 SUBMITTALS

- A. Shop Drawings, Calculations, and Product Data to Illustrate:
 1. Conformance with Performance Requirements:
 2. Clamp shaped to fit roofing standing seam with load test information.
 3. Installation location layout and details:
 - a. Dimensioned roof layout plan of snow guards.
 - b. Attachment clamp spacing, location, and screw torque.
 4. Fasteners:
 - a. Type, corrosion resistance, size, and spacing to be used.
 5. Joints:
 - a. Configuration of components and screw anchors.

- B. Samples:
 - 1. Submit an 18-inch long, illustrating clamp system with a cross member.
- C. Certificates:
 - 1. Manufacturer's certification of conformance to performance requirements.

1.5 QUALITY ASSURANCE

- A. Snow Guard Manufacturer Qualifications:
 - 1. At least 25 successful jobs manufacturing non-penetrating fasteners onto standing seam metal roofing like that proposed.
 - 2. The Snow Guard Manufacturer shall have recommended installation details based on snow load and slope.
- B. Pre-Installation Conference: Attended by CONTRACTOR, Installer, and OWNER'S REPRESENTATIVE.
 - 1. Schedule a conference in advance of the start of work.
 - 2. Approved submittals and samples of snow guard materials shall be available at the conference.
- C. Test clamp screw tensions, for compliance with approved snow guard manufacturer, at 5 locations selected by OWNERS REPRESENTATIVE.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to meeting specified criteria:
 - 1. Metal Roof Innovations: www.S-5.com
 - 2. AceClamp: www.aceclamp.com
 - 3. Alpine Snowguards: www.alpinesnowguards.com
 - 4. Dynamic Fastener Dyna-guard: www.dynamicfastener.com

2.2 COMPONENTS:

- A. Clamps: shaped to allow nonpenetrating clamp onto indicated metal roofing profile.
 - 1. Smooth round bullet nose-shaped stainless steel screw contacts with roofing.
 - 2. Manufactured from 6061-T6 aluminum extrusions and conforming to ASTM B221 or aluminum castings conforming to ASTM B85.
- B. Cross Member Attachment clips:
 - 1. Manufactured from 6061-T6 aluminum extrusions conforming to ASTM B221.
 - 2. Screws for attachment of clips to clamps: stainless steel.
- C. Cross Members:
 - 1. Manufactured from 6061-T6 aluminum extrusions, or tubes conforming to ASTM B221.
 - 2. Provide splice connectors ensuring alignment and structural continuity at end joints.
 - 3. Any color strip inserts into extruded aluminum cross members. Same material and finish as roof panels: Kynar/Hylar paint finish.
- D. Intermediate Snow Retention Dams: extruded aluminum: clip or screw onto cross members.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrate, DRAWING Details, and conditions under which roof Snow Guards will be installed.
- B. Verify field measurements. Modify work as required for accurate fit.
- C. Verify snow guard installation will not impede roof drainage.
- D. Beginning installation shall mean acceptance of existing conditions as capable of producing an acceptable job.

3.2 PREPARATION

- A. Clean areas to receive attachments; remove loose and foreign matter between the snow guard clamp and roofing.

3.3 SNOW SLIDE GUARD INSTALLATION

- A. Install where indicated on the approved roof layout plan.
 - 1. As a minimum: a row 12-inches above the eave, and a second row 1/5th of the eave to the highest location on the sloped roof.
- B. Install the system following the snow guard manufacturer's instructions and approved shop drawings.
- C. Place clamps in straight-aligned rows.
- D. Tighten clamp screws to the manufacturer's recommended torque using a calibrated torque wrench.
- E. Attach cross members to clamps; tighten bolts to manufacturer's recommended torque.
- F. Install splice connectors at cross-member end joints. Install snow dams between each attached clamp.

3.4 ADJUSTING AND CLEANING

- A. Remove cuttings and metal shavings from finished surfaces at the end of each day.

END OF SECTION

JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 07 27 10 – Air and Water Barriers
- B. Section 07 62 10 – Flashing and Trim
- C. Section 08 54 13 – Fiberglass Windows
- D. Section 09 21 16 – Gypsum Board Assemblies
- E. Section 09 91 00 – Painting

1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this Specification. The publications are referred to in the text by the basic designation only. In case of conflict only the most stringent shall govern.
 - 1. ASTM C510 - Test Method for Staining and Color Change of Single or Multicomponent Joint Sealants.
 - 2. ASTM C717 - Terminology of Building Seals and Sealants.
 - 3. ASTM C719 – Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).
 - 4. ASTM C920 - Specification for Elastomeric Joint Sealants.
 - 5. ASTM C1193 - Guide for Use of Joint Sealants.
 - 6. ASTM C1330 – Specification for Cylindrical Sealant Backing for use with Cold Liquid Applied Sealants
 - 7. ASTM D1667 - Specification for Flexible Cellular Materials Poly Vinyl Chloride Polymers and Copolymers Foam (Closed-Cell).

1.3 SUBMITTALS

- A. Sealants including colors, backing, and bond breaker: Manufacturer's Literature: Including recommendations for cleaning substrate, application temperatures, and compatibility with adjoining surfaces and application.
 - 1. Verify Sealant adhesion, primer, and staining requirements.
- B. Product Labeling: Each sealant material container shall bear the manufacturer's label and name, type, color, and applicable standards.

1.4 QUALITY ASSURANCE

- A. Sealant manufacturer shall have been in the business of manufacturing construction sealants with at least 500 successful projects of similar size.
- B. Applicator shall be responsible for verifying sealants used are compatible with joint substrates.

1.5 DELIVERY AND STORAGE

- A. Deliver in the manufacturer's original unopened container, clearly identifying each product.
- B. Store under the manufacturer's recommendations.

1.6 TEMPERATURE REQUIREMENTS

- A. Do not apply sealants at ambient temperatures below those recommended in writing by the manufacturer, and in no case, in rain or snow, or with dirt, frost, or water on the components.
- B. Install sealants with temperatures between 25- and 55 degrees F. by temporary enclosure and heating as necessary for 12 hours before, during, and 24 hours after installation.
- C. Protect sealants until cured.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Compatibility: Provide sealants, backing, and primers that are compatible with one another and recommended by the manufacturer for substrates and for conditions of service.
- B. Acceptable Sealant Manufacturers: Subject to compliance with specified criteria:
 - 1. Dow Corning www.dow.com
 - 2. General Electric www.gesealants.com
 - 3. Tremco www.tremco.com
 - 4. Sika Corporation www.usasika.com
 - 5. Sonneborn www.sonneborn.com

2.2 TYPICAL JOINT SEALANTS

- A. Typical use unless otherwise noted:
 - 1. Single component non-sag, non-staining, silicone type.
 - 2. Movement range 50 percent, plus or minus.
 - 3. Shore A hardness 15-25.
 - 4. Recommended in writing by the manufacturer for the condition of use.
 - 5. ASTM C920.
 - 6. Color: match adjacent surfaces as closely as possible unless indicated otherwise on the DRAWINGS, using one of the manufacturer's standard colors including black, white, brown, grey, and translucent.
- B. For metal flashing, and as indicated or specified in applicable product sections:
 - 1. Single component non-sag non-staining polyurethane type.
 - 2. Movement range plus or minus 25 percent.
 - 3. Shore A hardness 25-40.
 - 4. ASTM C920.
 - 5. Color: Same as those specified for silicone.

2.3 DRY FOAM TAPE SEALANT

- A. Self-stick adhesive roll form with resilient PVC foam core per ASTM D1667.
 - 1. Pressure-sensitive adhesive on one side.

2. 3/16-inch minimum thickness or as necessary for 30 percent compression in the completed joint.
 3. Closed cell water absorption: none.
 4. Corrosive reaction to bare metal: none.
 5. Service temperature range: 65 degrees F - 200 degrees F.
 6. Storage life: indefinite at 100 degrees F or below.
 7. Shrinkage: none.
- B. Acceptable Manufacturers: Subject to specified criteria:
1. Schnee-Morehead, Inc. (ITW) www.gluespec.com
 2. Gaska-Tape Inc. www.gaska.com
 3. Saint Gobain Norseal www.tapesolutions.saint-gobain.com

2.4 BACKING MATERIALS AND BOND BREAKERS

- A. Flexible closed cell polyethylene or polyurethane foam backing filler rod and bond break tips per ASTM C1330 and recommended in writing by the sealant manufacturer for joint conditions. Bond breaker materials shall not stain adjacent materials.
- B. Oversized thirty to fifty percent larger than joint width.
- C. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit the application to prevent 3-sided adhesion where the backer rod cannot be used.

2.5 PRIMERS AND CLEANERS

- A. Recommended in writing by the sealant manufacturer for the joint material and condition of use.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine DRAWINGS and field conditions to receive sealants for defects that will adversely affect the work, and for deviations beyond allowable tolerances.
- B. Beginning of installation shall mean the installer accepts existing conditions as capable of producing an acceptable job.

3.2 PREPARATION

- A. Clean and remove loose dirt, oil, corrosion, curing agents, protective coatings, existing sealants, waterproofers, moisture, frost, and other foreign material from surfaces to receive sealants and primers using approved techniques and cleaning agents recommended by the sealant manufacturer.
- B. Paint: Where scheduled shall be applied after sealant application.
- C. Primer: Where recommended by the sealant manufacturer shall be neatly applied before backup materials and sealant application. Mask or otherwise protect adjacent surfaces from the excess primer.

3.3 BACKING MATERIALS AND BOND BREAKERS INSTALLATION

- A. Install per ASTM C1193, approved sealant manufacturer's written recommendations, and the following. Apply acoustical sealants per ASTM C919. Verify non-staining of adjacent porous materials and compatibility.
- B. Use joint backer bond breaker filler rod for joints over 1/4- inch wide.
- C. Allow for the manufacturer's recommended width-to-depth ratio. Do not set deeper than the width of the joint.
- D. Do not stretch lengthwise to the joint.

3.4 SEALANT INSTALLATION

- A. Apply following the manufacturer's written recommendations for conditions of use.
- B. Mask as necessary to provide straight neat edges.
- C. Size sealant materials to achieve the sealant manufacturer's recommended width-to-depth ratio: typical depth in joint shall be 1/2 width of the joint. Sealant depth shall be 1/4 to 3/8 inch and joint width at least 2 times the expected movement.
- D. Lapped joints: shall receive continuous bed of sealant or sealant tape before assembly. Whenever practical, joints shall be bedded or coated continuously before assembly. Lap joint sealant shall have a minimum lap width of 3/8 inch by 1/4-inch minimum depth.
- E. Apply under continuous pressure ahead of the sealant gun.
- F. Tool joints as soon as possible to produce a consistent smooth joint without voids and foreign matter shape sealant to shed water.
- G. Completed sealed joints shall have a uniform, straight sealant bead free of voids, sags, and foreign material.

3.5 JOINTS TO RECEIVE SEALANT

- A. Exterior: Building joints exposed to the weather and moisture in the completed work as specifically indicated on DRAWINGS and including:
 - 1. Window frames.
 - 2. Pipe and duct penetrations in walls and roof.
 - 3. Metal roof and wall panels.
 - 4. Flashing joints.
 - 5. Top of reglets.
- B. Interior as specifically indicated on DRAWINGS and including:
 - 1. Around window frames.
 - 2. Around pipe and duct penetrations in walls and roof.
- C. Other Joints: As indicated on DRAWINGS and SPECIFICATIONS.

3.6 CLEAN UP

- A. Remove surplus materials and excess sealant from surrounding surfaces at completion of

each day's work.

END OF SECTION

FIBERGLASS WINDOWS

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 07 27 10 – Air and Water Barriers
- B. Section 07 62 10 – Flashing and Trim
- C. Section 07 92 00 - Joint Sealants

1.2 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this Specification. The publications may be referred to in the text by basic designation only. In case of conflict, the most stringent provisions shall apply.
 - 1. Glass Association of North America (GANA) - Glazing Manual.
 - 2. Sealed Insulating Glass Manufacturers Association (SIGMA) - Recommended Practices for Vertical Field Glazing of Organically Sealed Insulating Glass.
 - 3. ASTM C1036 - Specification for Flat Glass.
 - 4. ASTM E283 - Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences across the Specimen.
 - 5. ANSI/ASTM E330 - Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - 6. ASTM E331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - 7. ASTM E547 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.
 - 8. ASTM E2190 – Specification for Insulating Glass Unit Performance and Evaluation.
 - 9. ASTM E1300 – Practice for Determining Load Resistance of Glass in Buildings.
 - 10. ASTM E2112 – Standard Practice for Installation of Exterior Windows, Doors, and Skylights
 - 11. AAMA/WDMA/CSA101/I.S.2/A440-North American Fenestration Standard/Specification for Windows, Doors, and Skylights.
 - 12. National Fenestration Rating Council (NFRC) certification.

1.3 PERFORMANCE REQUIREMENTS

- A. Conform to IBC 1709.5: test and label as conforming to AAMA/WDMA/CSA 101/I.S.2/A440 or tested per ASTM E330 for wind loads specified.
 - 1. Wind Loads: No glass breakage or permanent deformation with 45 pounds per square foot positive and negative test pressure.
 - 2. Window air leakage: 0.1 cubic foot per minute per square foot maximum at 1.57 (25 mph) per ASTM E283.
 - 3. No water penetration at 7.5 pounds per square foot 5 gallons water per hour/square foot resistance test pressure per ASTM E331 or ASTM E547.
 - 4. Condensation resistance: CFR class C45.
 - 5. Thermal resistance "U"; 0.29 maximum.

1.4 SUBMITTALS

- A. Submit shop drawings and product data per General Conditions – Submittal Procedures.
- B. Include dimensions, glass specifications, internal cross sections, internal drainage, reinforcement, relation to adjacent materials, hardware, anchor methods, materials, and locations.
- C. Manufacturer's certificate that window units meet or exceed specified requirements.
- D. Manufacturer's installation instructions.

1.5 SAMPLES

- A. Submit a sample window if other than listed manufacturers are proposed. Approved window sample will be returned for use on work.

1.6 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in fiberglass plastic window manufacturing with 5 years of experience.
- B. Label window and glass indicating compliance with specifications.

1.7 WARRANTY

- A. Provide a 5-year window manufacturer's warranty.
 - 1. Replace insulating glass units that show obscuration, condensation, or cracks.
 - 2. Replace window frames or sash that deflect or crack.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to specified criteria:
 - 1. Pella Corporation <http://www.pella.com>
 - 2. Milgard: www.milgard.com
 - 3. Marvin: www.marvin.com
 - 4. Comfort Line Fiberframe: www.fiberframe.com
 - 5. Alpen: www.thinkalpen.com

2.2 WINDOW UNITS

- A. Type: Fixed, non-operable glass as indicated on DRAWINGS.

2.3 FRAMES

- A. 3-inch minimum through wall dimension multi-chambered hollow pultruded fiberglass with internal metal reinforcement where necessary to resist wind and gravity deflection and to provide attachment to the structure.
 - 1. Form pultruded fiberglass stops, closure trims, weather stops, joint trims, and attached flashings for weather-tight fit into the window frame section.
 - 2. Nominal wall thickness: 5-layer fiberglass mat reinforced: .05 to .07 inch.

3. Provide internal insulation where necessary to meet thermal requirements.
- B. Bevel slope exterior members to shed water.
- C. Miter and internally reinforce corner joints watertight and inject with sealant-adhesive.
- D. Provide combinations of window units joined at mullion by the manufacturer for a single rough opening, where indicated. Provide metal reinforcement concealed between joined mullions to conform to performance requirements.
- E. Provide internal drainage of glazing spaces through channels and weep holes to carry moisture to the exterior.

2.4 GLASS

- A. Sealed double clear glass argon-filled units.
- B. Glass thickness to meet wind loads.
- C. Float glass per ASTM C1036. Air space not less than ¼-inch.
 1. Low E coating on inside surfaces 2 or 3.
 2. Winter night U value: 0.29 maximum.
 3. Condensation resistance: C55 minimum.
- D. Meet Class A, requirements when tested per ASTM E2190 for sealed units.
- E. Glaze following GANA manual for a resilient watertight installation.
- F. NFRC label each window.

2.5 ATTACHMENT ACCESSORIES

- A. Frame manufacturers approved fasteners, shims, anchor clips, or jamb screws to resist wind load.
 1. Metal Finish: Stainless or galvanized steel.
 2. Fasteners: 1/4-inch diameter stainless or galvanized steel screws. 12-inch maximum spacing all around the rough opening.

2.6 SEALANT

- A. Single component silicone per Section 07 92 00-Joint Sealants.
- B. Tape Sealant: Self-stick adhesive roll form with closed cell resilient foam core per Section 07 92 00-Joint Sealants.
- C. Insulating foam sealant: spray applied single component low-expanding foamed in place urethane-isocyanurate foam plastic. Single-component pre-mixed spray can be recommended for window sealing by foam manufacturers.

2.7 FINISHES

- A. Exposed Surfaces: Factory powder coat or factory enamel color finish.
- B. Color: White, Tan, or Brown, as selected.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces and Drawing details to receive the windows for defects that will adversely affect the work, and for deviations beyond allowable tolerances.
- B. Coordinate to provide rough-in dimensions needed for 1/2 to 1-inch clearance between the window and building opening all around.
- C. Start of work shall mean acceptance of interfacing surfaces as capable of producing an acceptable job.

3.2 PREPARATION

- A. Prepare to open to permit the correct installation of window unit and building wall vapor retarder seal and air barrier.

3.3 INSTALLATION

- A. Install windows under manufacturer's instructions, approved submittals, and ASTM E2112. Screw through frame or window manufacturers mount clip with 1-inch minimum penetration inch into building surround framing.
- B. Maintain alignment with adjacent work. Screw the window to the building opening and shim without distortion or stress by allowing 1/2 -inch minimum space between the window and building rough opening. Minimum 1/4-inch screws evenly spaced 12-inches all around.
- C. Install metal flashing over the window head.
- D. Install flexible liquid applied flashing per Section 07 63 10 – Flashing and Trim over window frame into the rough opening at windowsill and jambs, and over metal flashing at the head. Turn up sill flashing 2 inches minimum at jambs.
- E. Seal air and vapor barriers to the window frame. Install foam insulation in void spaces around the window and rough opening without distorting the window frame.
- F. Install continuous bead of silicone sealant and related backing materials at the exterior and interior of the installed assembly as specified in Section 07 92 00 - Joint Sealants.

3.4 TOLERANCES

- A. Plumb and Level: Plus or minus 1/8 inch from true measurement.
- B. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch from 10-foot straight edge.

3.5 CLEANING

- A. Clean window frames and glass with non-solvent soap.
- B. Remove labels and visible markings.

- C. Remove debris, excess sealant and stains from surrounding surfaces that were caused by window installation.

END OF SECTION

GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 07 92 00 - Joint Sealants
- B. Section 09 91 00 - Painting

1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this Specification. The publications may be referred to in the text by basic designation only. In case of conflict only the most stringent shall apply.
 1. ASTM A568 - Specifications for General Requirements for Steel, Sheet, Carbon and High Strength Low-Alloy, Hot-Rolled Sheet, and Cold-Rolled Sheet.
 2. ASTM A653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process.
 3. ASTM A1003 - Specification for Steel Sheet, Carbon, Metallic, and Nonmetallic - Coated for Cold-Formed Framing Members.
 4. ANSI/ASTM C475 - Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 5. ANSI/ASTM C645 - Specification for Nonstructural Steel Framing Members.
 6. ANSI/ASTM C754 - Specification for Installation of Framing Members to Receive Screw Attached Gypsum Board.
 7. ASTM C834 - Specification for Latex Sealants.
 8. ASTM C840 - Specification for Application and Finishing of Gypsum Board.
 9. ASTM C841 - Standard Specification for Installation of Interior Lathing and Furring.
 10. ASTM C919 - Practice for Use of Sealants in Acoustical Applications.
 11. ASTM C954 - Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs 0.033 inches to 0.112 inches in Thickness.
 12. ASTM C955 - Specification for Load-Bearing Steel Studs, Runners and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases.
 13. ASTM C1002 - Specification for Steel Self-Piercing Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 14. ASTM C 1047 - Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 15. ASTM C1177 - Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 16. ASTM C1178 - Specification for Glass Mat Water-Resistant Gypsum Backing Board.
 17. ASTM C1325 - Specification for Non-Asbestos Fiber-Mat Reinforced Cement Interior Substrate Sheets.
 18. ASTM C1396 - Standard Specification for Gypsum Board.
 19. ASTM C 1629 - Classification for Abuse Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.
 20. ASTM C 1658 - Specifications for Glass Mat Gypsum Panels
 21. ASTM D 3273 - Test Method for Resistance to Mold Growth on the Surface of Interior Coatings in an Environmental Chamber.
 22. ASTM D5420 - Test Methods for Impact Resistance of Flat, Rigid Plastic Specimen.
 23. ASTM D5034 - Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test).
 24. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.

25. ANSI/ASTM E90 – Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
26. ANSI/ASTM E119 – Test Method for Fire Tests of Building Construction and Materials.
27. ASTM E695 – Test Method of Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact Loading.
28. ANSI A108.11 – Interior Installation of Cementitious Backer Units.
29. ANSI A118.9 - Standard for Test Methods and Specifications for Cementitious Backer Units.
30. Gypsum Association (GA) 201 - Using Gypsum Board for Walls and Ceilings.
31. GA 203 - Installation of Screw-Type Steel Framing Members to Receive Gypsum Board.
32. GA 214 – Recommended Levels of Gypsum Board Finish.
33. GA 216 - Specifications for the Application and Finishing of Gypsum Panel Products.
34. GA 219 - Instructions for Installation of Steel Door Frames in Steel Stud Gypsum Board Fire-Rated Partitions.
35. GA 600 - Fire Resistance Design Manual.
36. Underwriters Laboratories (UL) Listing and Fire Resistance Directory.

1.3 SUBMITTALS

- A. Provide product data and installation instructions for metal framing, top track deflection framing, and edge trim.

1.4 QUALITY ASSURANCE

- A. Applicator: Company specializing in gypsum board systems with at least 25 jobs like this within the last 5 years.

1.5 REGULATORY REQUIREMENTS

- A. Conform to IBC for fire-rated assemblies: UL, Gypsum Association, or ICC listed assemblies.
- B. Conform to IBC for Steel Studs.

1.6 STORAGE AND HANDLING

- A. Maintain gypsum wallboard above ground protected from weather and moisture.
- B. Do not overload the structure by storing concentrated stacks of gypsum wallboard.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Maintain work area, substrate, and materials 55 to 85 degrees F, 70 percent maximum relative humidity for 48 hours before, during, and 72 hours minimum after installation or until completely dry.
- B. Provide adequate ventilation.
- C. Provide lighting of 80-foot candles at work with explosion-proof electrical fixtures. Building lights may be used.

PART 2 - PRODUCTS

2.1 GWB NONSTRUCTURAL STUDS AND TRACK - RUNNERS

- A. Sheet steel channel or cee-shaped at least 1-1/4-inch knurled return flange suitable for nested or interlocked lapped splicing and screw attachment of gypsum wallboard per ASTM C645 or C955.

2.2 FRAMING AND FURRING ACCESSORIES

- A. ASTM C645 and GA 216: Bridging-bracing straps, angles, anchors, plates, brackets, and the like shall be at least 20-gauge galvanized sheet steel, matching studs, and as recommended by the stud manufacturer.
- B. Furring: ASTM C645, 20-gauge galvanized sheet steel hat-shaped channel, or zee-shaped 7/8-inch deep for screw attachment of wallboard. Clips, adjustable brackets, and other anchorage as necessary.
- C. Carrying Channels: ASTM C645, 1-1/2 inch cold rolled steel, 16-gauge (0.05 inch) thick minimum. Galvanized per ASTM A653.
- D. Hanger Wire: Minimum 12-gauge galvanized soft annealed steel.
- E. Tie Wire: Minimum 16-gauge galvanized soft annealed steel.

2.3 FASTENERS

- A. Self-drilling, self-tapping drywall, and metal screws to penetrate framing and per ASTM C954 and GA 216. Only GWB screws in GWB, no nails allowed. Use hot-dip galvanized zinc coated or stainless screws in exterior walls, showers, tub enclosures, exterior entries, exterior sheathing, and similar wet use areas.
 - 1. Length to penetrate GWB and backing.
- B. Metal Studs to Runners, Furring Channels, and Other Metal Accessories: Self-drilling, self-tapping pan head type "S" screws in accord with ASTM C 954, size per metal stud manufacturer's written instructions for specified fire resistance but not less than No.6: 3/8 inch long.

2.4 FRAMING ANCHORS

- A. Standard commercial threaded expansion anchors: IBC approved and recommended for intended use by the manufacturer may be used if approved by the OWNER'S REPRESENTATIVE. Submit the manufacturer's literature indicating lateral (shear) and pullout (tension) data for approval.
- B. Anchor diameter 1/4-inch minimum and 400-pound minimum average pullout. Length for 1 1/2-inch minimum embedment.
- C. Each anchor shall be capable of developing at least 4 times the design load in lateral (shear) and pullout (tension) loads into the substrate, for condition of use.
- D. Explosive driven anchors are not permitted into masonry.

- E. Powder driven anchors are not permitted for tension without IBC approval for the condition of use.

2.5 GYPSUM BOARD (GWB)

- A. Typical Interior Gypsum Board: ASTM C1396; fire resistive Type X 5/8 inch thick, edges tapered; ends square cut. Mold resistance 10 per ASTM 3273.

2.6 SEALANT

- A. Single-component silicone for penetrations.

2.7 ACOUSTICAL SEALANT

- A. Single component non-hardening, latex base non-skinning per ASTM C834, for use in conjunction with gypsum board; manufactured by U.S.G. Company, W.W. Henry Co., Pecora, or approved.

2.8 CORNER BEADS

- A. "L"-Shaped paper-faced galvanized steel or zinc tape-on-type per ASTM C1047 or GA 216.

2.9 EDGE TRIM

- A. Paper-faced galvanized steel or zinc "LC" – shaped 3/4-inch minimum leg tape-on type, without screws, per GA 216, or ASTM C1047.

2.10 CONTROL JOINTS

- A. Galvanized steel or zinc 1/2-inch gap tape-on-type with masking strip removable after finishing per GA 216, or ASTM C1047.

2.11 JOINT COMPOUND AND JOINT TAPE

- A. ASTM C475 and GA 216 compatible joint compound and adhesive, from a single manufacturer. A joint compound is recommended in writing for additional mold resistance by the manufacturer.
 1. Use glass fiber tape with setting-type compound in high moisture areas.
 2. Glass Fiber Tape: Alkali-resistant open weave glass-mesh fabric: 4 ounces per square yard minimum weight.

2.12 ANCHORAGE BACKING FOR WALL MOUNTED ACCESSORIES

- A. Minimum 16 gage sheet steel by 6 inches wide by length required and across 3 studs minimum.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the DRAWING details and verify field conditions for defects that will adversely affect the work, and for deviations beyond allowable tolerances.

- B. Other work shall be completed behind wall studs and above ceilings before the start of GWB work, particularly mechanical, electrical, structural, fire spray, and insulation.
- C. Start of installation shall mean acceptance of the existing conditions as capable of producing an acceptable job.

3.2 GENERAL SYSTEMS INSTALLATION

- A. Per manufacturer's written instructions, referenced publications and IBC.
- B. Do not install interior products until the installation area is enclosed and heated.

3.3 METAL STUD INSTALLATION

- A. Install studding per ANSI/ASTM C754, ASTM C645, and GA 201, manufacturer's instructions, and the DRAWINGS.
 - 1. Set floor tracks in sill sealer insulation.
 - 2. Anchor tracks to structure at 18 inches maximum and 2 inches from each track end.
 - 3. Splice tracks with 16-inch piece at stud with two screws per flange to each piece of track.
 - 4. Install studs so open sides face the same direction.
- B. Metal Stud Spacing: 16 inches on center.
 - 1. Install framing around structural and other penetrations.
- C. Stud Heights: Full height from floor to structure above.
- D. Door Opening Framing: Install two full-height studs at each side of the door jamb. Per GA219 install stud tracks at frame head height, and between adjacent studs. Screw double studs together - with additional flat plate as necessary.
- E. Backing and Blocking: Screw across three studs minimum. Install backing for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware handrails, and other GWB-mounted fixtures indicated.
- F. Bridging required where GWB not installed each side full height: Install bridging straps at midpoints of studs or 4 feet maximum for studs over 12 feet high. Use a stud track-runner screw attached to each stud or a continuous flat sheet metal strap across the faces at studs.
- G. Coordinate installation of backing, anchors, blocking, electrical, and mechanical work placed in or behind partition framing.

3.4 CEILING AND SOFFIT FRAMING INSTALLATION

- A. Install per ANSI/ASTM C754, ASTM C645, GA 201, and IBC Chapter 25.
- B. Either studs or wire hangers are acceptable for ceiling support.
- C. Attach each hanger wire, stud track, and brace to the structure with IBC approved anchors. Coordinate and supply embedded hangers or insert them into the structure as needed.
- D. Ceiling studs (studs not touching the floor) and joists shall be 24 inches on center maximum.
 - 1. Install ceiling studs with 45-degree brace studs to structure the deck above 6 feet maximum on center on opposite sides of ceiling assemblies.

- E. Position hanger wires for the load supported and in accord with ASTM C754 and GA 201 and four feet maximum spacing. Coordinate location to avoid other work with a 6-inch minimum space.
- F. Space carrying channels 4 feet maximum and within 6 inches of walls. Lap channels splice 2 feet and secure each end with double-strand tie wire.
- G. Provide hangers at ends of each runner and carrying channel 6-inch maximum from ends.
- H. Do not slope hangers over one inch in 6 inches horizontally unless equal counter-sloping hangers are provided.
- I. Provide a trapeze or equivalent device where obstructions prevent direct suspension. Minimum trapeze bar: two carrying channels wire tied together.
- J. Wrap end of hanger wires 3 full turns in 3 inches at connections and loop tightly to prevent vertical movement or rotation of member.
- K. Adjust hanger wires taught do not kink or bend hanger wire to level ceiling.
- L. Provide two extra hanger wires above opposite edges of gypsum ceiling-mounted air duct outlets and light fixtures for attachment by duct and light installers.

3.5 SEALANT INSTALLATION

- A. Apply sealants per Section 07 92 00 - Joint Sealants.
- B. Install acoustical sealant continuously at gypsum board perimeter per ASTM C919 at:
 - 1. Metal Framing: track, header, and jamb intersect.
- C. Seal penetrations of gypsum fire-rated assemblies by conduit, pipe, ductwork, rough-in boxes, and hardware with silicone sealant fire-stopping systems. Seal acoustic-sound-rated assemblies with acoustical sealant.

3.6 GYPSUM BOARD INSTALLATION

- A. Install GWB per ASTM C840, and GA 216, and manufacturer's instructions to meet fire resistance indicated. Extend gypsum board continuously into and behind recessed wall-mounted accessories such as fire extinguishers and toilet accessories in fire resistance-rated walls.
 - 1. Verify insulation and vapor retarder is installed and approved before installing GWB.
- B. Cut GWB neatly to fit in moderate contact and neatly against adjacent GWB. Cut around penetrations for 1/4 to 1/2-inch space between gypsum and penetration. Bevel untapered panel edges approximately 1/8 inch at a 45-degree angle using a sharp utility knife. Peel back and remove any loose facing from the edges.
- C. Install the lead edge of GWB to open the end of stud flanges first. Stagger joints on opposite sides of wall studs by one stud minimum.
- D. Use screws for fastening gypsum board: 8 inches maximum spacing over backing. Drive screws flush. Use appropriate short screws on resilient furring channels to avoid penetrating support.

3.7 CONTROL JOINT INSTALLATION

- A. Install control joints parallel with lines of building spaces where substrate joints such as seismic joints or material changes occur and in uninterrupted gypsum board or cement board spaces: 30 feet maximum for walls and 900 square feet total area between control joints.
- B. Install control joints in line with the jamb edge of door openings over 10 feet wide.

3.8 GYPSUM EDGE TREATMENT

- A. Place corner beads at external corners. Use the longest practical length.
- B. Place edge trim where the gypsum board abuts dissimilar materials and where the gypsum ends are exposed to view.

3.9 JOINT AND SURFACE TREATMENT

- A. Embed tape at GWB joints and interior angles with a joint finishing compound in accordance with ASTM C840, and GA 216. Fill and smooth exposed joints, edges, and depressions to produce a smooth flush surface ready to receive finishes specified following the manufacturer's instructions.
 - 1. Allow sufficient drying time between coats to obtain a moisture content of 12 percent or less on GWB and joints.
 - 2. No heavy texture permitted.
- B. Smoothly feather joint compound coats onto adjoining surfaces.
- C. Finish joints to a width of at least 6-inches on each side.
- D. Levels of Surface Treatment in accord with ASTM C840 and GA214:
 - 1. Non-exposed areas, as above suspended ceilings: Level 2: Embed tape at joints and apply joint compound over fasteners and trim.
 - 2. Boiler, Janitor, and Mechanical-Electrical Rooms: Level 3: Embed tape and apply two separate coats of joint compound over joints, and fasteners. The joint compound shall be smooth and free of tool marks and ridges.
 - 3. Walls and Ceilings: Level 5: All joints and interior angles shall have tape embedded in the joint compound. Two separate coats of joint compound are applied over all flat joints and one separate coat of joint compound is applied over interior angles. Cover fastener heads and accessories with three separate coats of joint compound. A thin skim coat of joint compound trowel applied, or a material manufactured especially for this purpose and applied following the manufacturer's recommendations shall be applied to the entire surface. The surface shall be smooth and free of tool marks and ridges.
 - 4. Joints and fasteners behind any tile and fiber-reinforced plastic panels: Level 2: Tape and fill and sand lightly to even surface.
- E. Use sandpaper or abrasive-mesh cloth with grit as fine as practical.
- F. Remove sanding dust with a damp rag before recoating.

3.10 GWB AND GWB STUD FRAMING TOLERANCES (NON-CUMULATIVE)

- A. To Subfloor: 1/4-to-1/2-inch space. Smooth without abrupt changes. Space around Mechanical, Electrical, and Other Penetrations: 1/4 to 1/2 inch before sealing.

- B. Bowing or Warping from Proper Plane: plus minus 1/8 inch in 10 feet.
- C. Joint Surface Alignment Before Taping: flush surfaces plus or minus 1/16 inch.
- D. Joint Spacing Before Taping: 1/16 to 1/8 inch.
- E. Gaps Between Perimeter Edge Trim Molding and Abutting Surfaces: 1/8 inch maximum with no abrupt changes.
- F. Exposed Surface Texture: Smooth without texture, pock holes, or scratches over 1/64 inches within any 2 square feet.

3.11 CLEANING

- A. After final taping and sanding, lightly wipe GWB surfaces with a damp rag to remove dust and dirt.
- B. Leave in condition to receive primer - sealer.

END OF SECTION

PAINTING

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 07 62 10 – Flashing and Trim
- B. Section 07 92 00 – Joint Sealants
- C. Section 08 54 13 – Fiberglass Windows
- D. Section 09 21 16- Gypsum Board Assemblies

1.2 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this Specification. Publications may be referenced in the text by basic designation only. In case of conflict, the most stringent apply.
 - 1. ASTM D16 – Standard Terminology for Paint-Related Coatings, Materials, and Applications.
 - 2. ASTM D610 – Practice for Evaluating Degree of Rusting on Painted Steel Surfaces.
 - 3. ASTM D714 – Test Method for Evaluating Degree of Blistering of Paints.
 - 4. ASTM D 2485 – Test Methods of Evaluating Coatings for High Temperature Service.
 - 5. ASTM D2486 – Test Method for Scrub Resistance of Wall Paints
 - 6. ASTM D3359 – Standard Test Methods for Measuring Adhesion by Tape Test.
 - 7. ASTM D4060 – Test Method for Abrasion Resistance of Organic Coating by the Taber Abraser.
 - 8. ASTM D4442 - Test Method for Direct Moisture Content Measurement of Wood and Wood-Base Materials
 - 9. ASTM D4541 – Test Method for Pull-Off Strength of Coatings Using Portable Adhesion-Testers.
 - 10. ASTM D5894 – Practice for Cyclic Salt Fog/UV Exposure of Painted Metal.
 - 11. ASTM D6677 – Standard Test Method for Evaluating Adhesion by Knife.
 - 12. ASTM D7091 – Practice for Nondestructive Measurement of Dry Film Thickness of Nonmetallic Coatings Applied to Ferrous and Nonmagnetic Nonconductive Coatings Applied to Non-ferrous Metals.
 - 13. Society for Protective Coatings/Steel Structures Painting Council (SSPC) - Standards and Specifications.
 - 1) SSPC-SP 1 – Solvent Cleaning.
 - 2) SSPC-SP 2 – Hand Tool Cleaning.
 - 3) SSPC-SP 3 – Power Tool Cleaning.
 - 4) SSPC-SP5/NACE No. 1, White Metal Blast Cleaning.
 - 5) SSPC-SP6/NACE No. 3, Commercial Blast Cleaning.
 - 6) SSPC-SP7/NACE No. 4, Brush-Off Blast Cleaning.
 - 7) SSPC-SP10/NACE No. 2, Near-White Blast Cleaning.
 - 8) SSPC-SP11, Power Tool Cleaning to Bare Metal.
 - 9) SSPC-SP12/NACE No. 5, Surface Preparation and Cleaning of Metals by Waterjetting before Recoating.
 - 10) SSPC-SP13/NACE No. 6, Surface Preparation for Concrete.
 - 11) SSPC-SP14 Industrial Blast Cleaning.
 - 12) SSPC-SP15 Commercial Grade Power Tool Cleaning.

1.3 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this section.

1.4 SUBMITTALS

- A. Provide product data on all coating and finishing products; indicating application instructions including surface preparation, undercoating, reducing, and certification that the product is "Best Line - Premium Grade".
- B. Submit a sample 1 by 2-inch minimum size illustrating the range of colors and textures available for each surface-finishing product.
- C. Submit samples of selected colors representative of actual work as follows:
 - 1. Minimum size: 3 by 3-inches.
 - 2. Approved samples shall become the final criteria for evaluating the color and appearance of completed work.
 - 3. One set of approved samples shall be kept on the job.
 - 4. Identify each sample as to finish, formula, color name, and number.
- D. Submit V.O.C. compliance certificate.

1.5 QUALITY ASSURANCE

- A. Product Manufacturer: Company specializing in manufacturing paint and coating finish products with 25 jobs similar in scope to the work proposed.
- B. Applicator: Specializing in commercial painting and coating application with at least 10 successful jobs like that proposed.
- C. Paint applicator shall certify the following:
 - 1. Immediately before painting, surfaces conformed to the specified preparation; they were in the specified condition; and were clean, dry, and free of dust, rust, and mill scale to the degree required by this Specification.
 - 2. Surface preparation and coating use, mixing, application, and curing were done under the current printed instructions and instructions of the coating manufacturer, and these Specifications.
 - 3. The products specified were used or a listing of the names of the products used and their manufacturer was submitted and approved.
 - 4. The products were used within the shelf-life dates of each container of each product used.
 - 5. The manufacturer's recommended dry film thickness of coatings on the work.
 - 6. Compatible paints were used where coatings are applied over previously applied coatings.

1.6 INDOOR AIR QUALITY

- A. Before painting inside the building coordinate with the user to operate the building's permanent ventilation system at maximum outdoor airflow before mixing and applying paint, and for a minimum of 72 hours after application.

1.7 REGULATORY REQUIREMENTS

- A. Conform to the International Building Code (IBC) for flame, fuel, and smoke-rating

requirements for completed finishes.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Store and protect products as recommended by the paint manufacturer.
- B. Deliver products to the site in sealed and labeled containers.
- C. Container labeling shall include the manufacturer's name, type of paint, brand name, manufacture data, coverage, surface preparation, drying time, clean up, color designation, and instructions for mixing and reducing.
- D. Store paint materials at an ambient temperature of 45 degrees F to 90 degrees F in a well-ventilated area, unless required otherwise by the manufacturer's instructions. Only materials to be consumed within a 24-hour work period are allowed at the work site.
- E. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.9 TEMPERATURE AND HUMIDITY REQUIREMENTS

- A. Provide continuous ventilation and heating equipment to maintain paint products and substrate dry and at ambient temperatures between 50- and 85-degrees F. for 24 hours before, during, and 48 hours after the application of finishes, unless permitted otherwise by the coating manufacturer's recommendations.
 - 1. Provide temperatures by temporary scaffold enclosures and heating as necessary.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 65 percent, unless permitted otherwise by the coating manufacturer's recommendations.
- C. Provide lighting of 80-foot candles at work. Building lights may be used.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Companies meeting the "Quality Assurance" criteria and these specifications.

2.2 PAINT MATERIALS

- A. Provide compatible products under approved paint manufacturers including paint, varnish, stain, enamel, lacquer, fillers, and related products for prime, intermediate, and finish coats.
- B. Accessory material not specifically indicated, but required, such as shellac, reducers, undercoats, primers, putty, and the like, shall be of a quality not less than required by applicable Specification Standards and recommended by the finish coat manufacturer in writing for compatibility and conditions of use.
- C. Paints containing lead shall not be used.
- D. All products "Best Line - PREMIUM GRADE" for professional trade sales recommended by the paint manufacturer for the conditions of use.
- E. Mixing

1. Furnish ready-mixed products except as otherwise specified.
2. Follow the manufacturer's directions for:
 - a. Field-mixing of pastes and powders.
 - b. Field-catalyzing components.
3. Coatings shall have good flowing application properties, capable of drying, or curing free of streaks or sags and yielding finish specified.

2.3 FINISHES

- A. Refer to the schedule at the end of the specification for surface finishes.

PART 3 - EXECUTION

3.1 GENERAL

- A. Coordinate time and areas of work with OWNER. Allow for building occupancy during work.

3.2 EXAMINATION

- A. Verify that surface and substrate conditions are ready to receive work as specified and as recommended by the paint manufacturer. Report any conditions that may adversely affect proper paint application.
- B. Examine DRAWINGS, SPECIFICATIONS, and field conditions to determine the extent of exposed piping, ducts, conduit, electrical controls, cabinets, and equipment and allow for painting as required.
- C. Beginning of application means acceptance of existing surfaces.

3.3 PROTECTION

- A. Protect elements surrounding the work of this section from damage or disfiguration.
- B. Mask and shut down heat and ventilation intakes when painting adjacent exterior surfaces.
- C. Repair damage to other surfaces caused by work of this Section.
- D. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- E. Protection of work when stopping for the day:
 1. Erect barriers and post warning signs. Confirm that no dust-generating activities will follow shutting down for the day.

3.4 ITEMS NOT TO BE PAINTED

- A. The following items shall be masked and not painted unless specifically scheduled:
 1. Items with factory finish paint, such as light fixtures, toilet partitions, factory-finished wall and soffit panels, vinyl wall coverings, and acoustical ceilings.
 2. Concealed areas such as pipe chases and areas above finish ceilings.
 3. Finished surfaces such as hardware trim, anodized aluminum, glass, stainless steel, bronze, and the like.
 4. Moving equipment wearing surfaces.

5. Equipment data plates, manufacturer's permanent maintenance labels, and fire door and jamb labels.

3.5 PREPARATION

- A. General: Clean and prepare the substrate for the finish as specified and as recommended by the coating manufacturer for conditions of use.
- B. Remove or coordinate and remove electrical plates, hardware, glazing stops, light fixture trim, and fittings before preparing surfaces and finishing. Replace removed items after painting.
- C. Clean surfaces and correct surface defects.
 1. Remove oil grease and mildew with detergent or SSPC-SP1 cleaning solvent first (do not use paint thinner, hydrocarbons, or turpentine as they leave residue).
 2. Remove dirt, dust, loose material, rust-scale, oil-grease, mildew, release agents, and non-adhering paint by sandpapering, grinding, scraping, or wire brushing.
 3. Sandpaper thick and sharp edges of the shop and existing paint and runs to smooth featheredge.
 4. Lightly sand or abrade surfaces dull to ensure adhesion.
 5. Fill or sand out cracks, holes, pits, and scratches, smooth to match the adjacent finish.
 6. Remove sanding dust before painting.
- D. Seal stain marks, which may bleed through subsequent, finishes.
- E. Existing coating to be re-painted or finished: remove loose, blistered, scratched, corroded finish, scaled or crazed finish to the base material surface, or feather edges smooth. Where new work joins existing work, prepare existing surfaces extending to the nearest break in the plane intersecting wall, ceiling, or pilaster.
- F. Impervious Surfaces: Remove mildew by scrubbing with a solution of T.S.P. or 3 parts water to 1 part household bleach. Rinse with clean water and allow the surface to dry.
- G. Concrete and Masonry and Plaster Walls: Free from loose surface areas, remove contamination with SSPC-SP2 or other approved methods. Verify required acid-alkali balance is achieved.
 1. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry.
 2. Remove loose mortar, paint sheen, scale, salt, and alkali powder, (efflorescence) and other foreign matter.
- H. Gypsum Board: Surfaces shall be clean, crack-free, and joints finished, before painting.
 1. If surface defects appear after prime coating, repair defects.
- I. Existing Gypsum Board Surfaces: Clean, then latex fill and smooth defects up to 2-inch holes flush with the adjacent surface and match the existing texture. Sand to a feather edge. Spot prime defects after repair.
- J. Galvanized Surfaces: Remove surface contamination and oils per SPC SP1 solvent cleaning and thoroughly rinse. Remove sheen per SPC SP2, hand tool cleaning. After cleaning, and before painting, remove dust and similar containments by vacuum. Apply primer immediately after cleaning.

- K. Uncoated Steel and Iron Surfaces: remove grease, scale, dirt, and rust per SSPC-SP1, Solvent Cleaning. Clean per SSPC-SP3 power tool cleaning, or SSPC-SP2 hand cleaning.
- L. Shop Primed Steel Surfaces: Solvent clean per SSPC-SP1 followed by sanding, scraping, and wire brushing per SSPC-SP2 hand cleaning to remove loose, scratched, or weathered-corroded shop finish primer weld burns and rust. Feather edges to make it inconspicuous. After cleaning and before painting remove dust and similar containments by air blast or vacuum.

3.6 APPLICATION

- A. Apply coatings to all visible exposed surfaces scheduled following the approved coating manufacturer's instructions and approved submittals for the conditions of use.
- B. Do not apply finishes to surfaces that are not clean, dull, and dry.
- C. Apply each coat to a uniform finish.
- D. Sand or abrade lightly and clean between coats to achieve adhesion if recommended by the coating manufacturer.
- E. Allow the applied coat to dry before the next coat is applied. Recoat within the time recommended by the manufacturer.
- F. Change colors or finishes at corners and joints.
- G. Apply materials so that the following results are obtained.
 - 1. Smooth uniform appearance, underlying paint edges feathered, free of brush marks, uneven orange peel, sags, runs, or foreign matter.
 - 2. Complete coverage without skips or streaks and heavy build-up in details.
 - 3. Close match with approved color.
 - 4. Sharp edges at adjoining materials or color changes.
- H. Inspection of Coats: Do not apply additional coats until each completed coat has been inspected by the CONTRACTING OFFICER.
 - 1. Only inspected and approved coats of paint shall be considered in determining number of coats applied.
 - 2. Refinish the entire surface if the coat is not acceptable.

3.7 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Paint shop primed items.
- B. Remove unfinished louvers, grilles, covers, steel glazing stops, access panels, and other loose components and paint separately.
- C. Clean, prime, and paint exposed mechanical and electrical work including pipes, pipe insulation, conduit, boxes, ducts, hangers, brackets, collars, and supports.
- D. Protect and retain the legibility of data plates and identification markings on mechanical and electrical equipment by masking.
- E. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint, to limit of sight line. Paint

dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.

- F. Replace electrical plates, hardware, light fixture trim, and fittings removed before finishing.

3.8 CLEANING

- A. As Work proceeds, promptly remove excess paint products where spilled, splashed, or spattered.
- B. During the progress of work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.
- C. Remove waste, cloths, and material, which may constitute a fire or V.O.C. hazard daily from the site.
- D. Leave surfaces not required to be finished under this section undamaged and clean and free of paint products from work of this Section.

3.9 COATING SCHEDULE

- A. General:
 - 1. For this schedule each coat shall be at least dry to the touch before proceeding with the following coat.
 - 2. Coating materials shall be recommended by the manufacturer for condition of use and compatible with undercoats.
 - 3. Minimum number of coats is scheduled. Apply additional finish coats as necessary to provide uniform-appearing coverage.
 - 4. Refer also to DRAWINGS.
 - 5. Sherwin Williams products are referenced. Other manufacturers having similar specifications meeting Quality Assurance specifications may be used.
- B. Exterior Coating Schedule:
 - 1. Concrete, Concrete Masonry, and Portland Cement Plaster:
 - a. One coat alkali and efflorescence-resistant acrylic latex masonry primer filler: Sherwin Williams, "Loxon".
 - b. Two coats exterior self-cleaning acrylic coating flat sheen, Sherwin Williams "Loxon" LX13-50 series.
 - 2. Steel previously painted, and steel galvanized:
 - a. Spot prime any rust or bare areas with single component topcoat compatible rust inhibitive primer: Sherwin Williams B66W00310 Pro Industrial "Pro-Cryl" Universal Primer.
 - b. First Coat: Single Component waterborne acrylic adhesion bond coating low sheen, Sherwin Williams B71W211 – "Bond Plex."
 - a) 300 psi minimum adhesion per ASTM 4541.
 - c. Second Coat: water-based urethane coating. Sherwin Williams "Aurolon 100".
 - a) 1000 psi adhesion per ASTM D4541.
 - b) 2000 hour weathering per ASTM D4587.
 - d. Third Coat: "Aurolon 100".
 - a) 1000 psi adhesion per ASTM D4541.
 - b) 2000 hour weathering per ASTM D4587.
 - 3. Steel-Shop Primed: spot prime or re-prime completely unless shop primer is acceptable for producing a finish coat without priming.
 - a. One coat topcoat compatible rust resisting alkyd resin primer, Sherwin Williams "B50".

- b. Two coats acrylic corrosion-resistant enamel, semi-gloss, Sherwin Williams "DTM B66".
 - 4. Steel-Galvanized:
 - a. One topcoat compatible acrylic emulsion primer Sherwin Williams "Pro-Cry Universal primer B66 Series".
 - b. Two coats acrylic corrosion-resistant enamel, semi-gloss satin sheen Sherwin Williams "DTM B66".
 - 5. Steel Galvanized Unpainted: Repair abrasions and field welds:
 - a. Two coats zinc zinc-rich epoxy primer per SSPC Paint 20: Sherwin Williams "Zinc Clad" or approved.
- C. Interior Coating Schedule:
- 1. Concrete, and Masonry
 - a. 1 coat alkali-resistant acrylic latex masonry primer filler: Sherwin Williams "Loxon" primer.
 - b. 2 coats water-based alkyd urethane enamel, semi-gloss sheen: Sherwin Williams "Pro Industrial".
 - 2. Steel and Aluminum – Bare Unprimed and Galvanized
 - a. One coat topcoat compatible rust-inhibiting acrylic latex primer: Sherwin Williams "ProCryl B66".
 - b. 2 coats acrylic corrosion-resistant enamel, satin sheen: Sherwin Williams "DTM B66".
 - 3. Steel Doors and Frames – Shop Primed: spot prime or re-prime completely unless shop primer is acceptable for finish coat without priming. Previously painted steel in sound condition without loose or cracked paint does not require primer.
 - a. One coat topcoat compatible rust-resisting industrial acrylic latex primer: Sherwin Williams "ProCryl B66".
 - b. 2 coats 100% acrylic corrosion-resistant coating, semi-gloss Sherwin Williams "DTM B66" series.
 - 4. Steel – Galvanized
 - a. Same as exterior.
 - 5. Plaster, Gypsum Board
 - a. Spot prime any stains with stain-blocking primer sealer over the stained area; Sherwin Williams "Quick Dry" B51 W08670, sealer primer surfacer, topcoat compatible.
 - b. First Coat: Latex high build primer Surfacer: Sherwin Williams "Preprite B28".
 - c. 2 coats washable acrylic latex enamel, eggshell sheen on walls, flat on ceilings. Sherwin Williams "ProMar 200" B31 2600.
 - 1) Apply a finish coat with uniform roller texture as approved in the mockup.

3.10 COLOR SCHEDULE

- A. Refer to the Drawings. Match adjacent surface color for the following:
 - 1. Access doors, registers, radiation unit covers, exposed piping, electrical conduit, and mechanical/electrical panels.
 - 2. Exterior wall and roof mounted pipes, ducts, conduits, flues and flashing.
- B. Exterior and interior windows and doors, their framing and trim: different color from adjacent walls.
- C. Paint surfaces visible behind vents, louvers, grilles and reveals in public areas: flat black.
- D. Ceilings shall be painted same a different color as than walls.
- E. Doors all the same color with a different color than frames.

END OF SECTION

COMMON WORK RESULTS FOR PLUMBING

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SCOPE

- A. All provisions of the Contract including the General and Supplementary Conditions and the General Requirements apply to this work.

1.03 WORK INCLUDED

- A. The work to be included in these and all other plumbing subsections shall consist of providing, installing, adjusting and setting into proper operation complete and workable systems for all items shown on the drawings, described in the specifications or reasonably implied. This shall include the planning and supervision to coordinate the work with other crafts and to maintain a proper time schedule for delivery of materials and installation of the work.
- B. Division 1 of the specifications is to be specifically included as well as all related drawings.

1.04 RELATED WORK

- A. Related Work Specified Elsewhere:
 - 1. Heating, Ventilating and Air Conditioning (HVAC) Specifications: Division 23.
 - 2. Electrical Specifications: Division 26.
- B. Unless otherwise indicated on the electrical drawings or the electrical schedules, provide all plumbing equipment motors, motor starters, thermal overload switches, control relays, time clocks, thermostats, motor operated valves, float controls, damper motors, electric switches, electrical components, wiring and any other miscellaneous Division 22 controls.

Disconnect switches are included in the electrical work, unless specifically called out on mechanical plans.

- C. Carefully coordinate all work with the electrical work shown and specified elsewhere.

1.05 REFERENCED CODES - LATEST ADOPTED EDITION

- A. NFPA 70 National Electrical Code (NEC).
- B. IMC International Mechanical Code.
- C. UPC Uniform Plumbing Code.
- D. IECC International Energy Conservation Code.
- E. IBC International Building Code.

1.06 PROJECT RECORD DRAWINGS

- A. In addition to other requirements of Division 1, mark up a clean set of drawings as the work progresses to show the dimensioned location and routing of all mechanical work which will become permanently concealed. Show routing of work in concealed blind spaces within the building. Show exact dimensions of buried piping off of columns or exterior walls.
- B. Maintain record documents at job site in a clean, dry and legible condition. Keep record documents available for inspection by the Project Manager.
- C. Show the location of all valves and their appropriate tag identification.
- D. At completion of project, deliver these drawings to the Engineer and obtain a written receipt.

1.07 SUBMITTALS

- A. See General Conditions and the General Requirements in Division 1 regarding submittals.
- B. Submit by specification section complete and all at one time; partial submittals will not be considered. Submittals shall be provided in electronic PDF Format. The data in the electronic file shall be arranged and indexed under basic categories in order of the Specification Sections. An index shall be included with bookmarks and identifying tabs between sections and references to sections of specifications
- C. Catalog sheets shall be complete and the item or model to be used shall be clearly marked, and identified as to which item in the specifications or on the drawings is being submitted and with drawing fixture number where applicable.
- D. Only submit on items specifically required by each specification section. If a submittal has not been requested, it will not be reviewed.
- E. Submit product data for:
 - 1. Hangers and Supports for Plumbing Piping and Equipment.

2. Vibration and Seismic controls for Plumbing Piping and Equipment.
3. Identification for Plumbing Piping and Equipment.

1.08 OPERATING AND MAINTENANCE MANUALS

- A. Submit maintenance manuals to the Engineer covering all equipment, fixtures, devices, etc. installed by the Contractor.
- B. The operation and maintenance manuals shall be submitted by specification section complete and all at one time; partial operations and maintenance manual submittals will not be considered. The Operation and maintenance manuals shall be provided in electronic PDF Format. The data in the electronic file shall be arranged and indexed under basic categories. An index shall be included with bookmarks and identifying tabs between sections and references to sections of specifications. The manual shall contain, but not limited to, the following types of information:
 1. Cover sheet with name, address, telephone number of Contractor, General Contractor and major equipment suppliers.
 2. Catalog cuts of all equipment, fixtures, etc. installed (Marked to identify the specific items used).
 3. Manufacturer's maintenance and overhaul instruction booklets including exploded views.
 4. Identification numbers of all parts and nearest sources for obtaining parts and services.
 5. A copy of valve schedule and reduced scale drawings showing valve locations.
 6. Written summary of instructions to Owner.
 7. All manufacturers' warranties and guarantees.
 8. Contractors Warranty Letter.
- C. A periodic maintenance form that includes all of the equipment shall be provided with the maintenance manual. The form shall list each piece of equipment and how often maintenance is required (daily, weekly, monthly, annually). Opposite each task shall be squares for check-off for a full year (initials) to verify that the tasks are being done.

1.09 HANDLING

- A. See General Conditions and the General Requirements in Division 1 regarding material handling.
- B. Deliver packaged materials to job site in unbroken packages with manufacturer's label, and store to facilitate inspection and installation sequence. All items must be labeled and identified as to make, size and quality.

1.10 SUBSTITUTIONS

- A. See General Conditions and the General Requirements in Division 1 for substitution request procedures.
- B. In accordance with the General Conditions and the General Requirements in Division 1, Substitution and Product Options, all substitute items must fit in the available space, and be of equal or better quality including efficiency performance, size, and weight, and must be compatible with existing equipment. The Engineer shall be the final authority regarding acceptability of substitutes.

1.11 DIMENSIONS

- A. Before ordering any material or doing any work, the Contractor shall verify all dimensions, including elevations, and shall be responsible for the correctness of the same. No extra charge or compensation will be allowed on account of differences between actual dimensions and measurements indicated on the drawings.
- B. Any differences, which may be found, shall be submitted to Engineer for consideration before proceeding with the work.

1.12 MANUFACTURER'S DIRECTIONS

- A. All manufactured articles shall be applied, installed and handled as recommended by the manufacturer, unless specifically called out otherwise. Advise the Architect/Engineer of any such conflicts before installation.

1.13 PERMITS, FEES, ETC.

- A. The Contractor under each Division of these specifications shall arrange for a permit from the local authority. The Contractor shall pay for any inspection fees or other fees and charges required by ordinance, law, codes and these specifications.

1.14 TESTING

- A. The Contractor under each section shall at his own expenses perform the various tests as specified and required by the Architect and as required by applicable code, the State and local authorities. The Contractor shall furnish all fuel and materials necessary for making tests.

1.15 TERMINOLOGY

- A. Whenever the words "furnish", "provide", "furnish and install", "provide and install", and/or similar phrases occur, it is the intent that the materials and equipment described be furnished, installed and connected under this Division of the Specifications, complete for operation unless specifically noted to the contrary.
- B. Where a material is described in detail, listed by catalogue number or otherwise called for, it shall be the Contractor's responsibility to furnish and install the material.
- C. The use of the word "shall" conveys a mandatory condition to the contract.
- D. "This section" refers to the section in which the statement occurs.
- E. "The project" includes all work in progress during the construction period.
- F. In describing the various items of equipment, in general, each item will be described singularly, even though there may be a multiplicity of identical or similar items.

1.16 SCHEDULE OF WORK

- A. The work under the various sections must be expedited and close coordination will be required in executing the work. The various trades shall perform their portion of the work at such times as directed so as to meeting scheduled completion dates, and to avoid delaying any other trade. The Architect will set up completion dates. Each contractor

shall cooperate in establishing these times and locations and shall process his work so as to ensure the proper execution of it.

1.17 COOPERATION AND CLEANING UP

- A. The contractor for the work under each section of the specifications shall coordinate his work with the work described in all other sections of the specifications to the end that, as a whole, the job shall be a finished one of its kind, and shall carry on his work in such a manner that none of the work under any section of these specifications shall be handicapped, hindered or delayed at any time.
- B. At all times during the progress of the work, the Contractor shall keep the premises clean and free of unnecessary materials and debris. The Contractor shall, on direction at any time from the Architect, clear any designated areas or area of materials and debris. On completion of any portion of the work, the Contractor shall remove from the premises all tools and machinery and all debris occasioned by the work, leaving the premises free of all obstructions and hindrances.

1.18 WARRANTY

- A. Unless a longer warranty is hereinafter called for, all work, materials and equipment items shall be warranted for a period of one year after acceptance by the Owner. All defects in labor and materials occurring during this period, as determined by the Architect/Engineer, shall be repaired and/or replaced to the complete satisfaction of the Architect/Engineer. Guarantee shall be in accordance with Division 1.

1.19 COMPLETION REQUIREMENTS

- A. In accordance with the General Conditions and the General Requirements in Division 1, Project Closeout; before acceptance and final payment, the Contractor shall furnish:
 - 1. Accurate project record drawings, shown in red ink on prints, showing all changes from the original plans made during installation of the work.
 - 2. Contractors One Year Warranty.
 - 3. All Manufacturers' Guarantees.
 - 4. Test and Balance Reports.
 - 5. Operation and Maintenance Manuals.

1.20 INSPECTION OF SITE - REMODEL PROJECTS

- A. The accompanying plans do not indicate completely the existing plumbing and mechanical installations. The bidders for the work under these sections of the specifications shall inspect the existing installations and thoroughly acquaint themselves with conditions to be met and the work to be accomplished in removing and modifying the existing work, and in installing the new work in the present building and underground serving to and from that structure. Failure to comply with this shall not constitute grounds for any additional payments in connection with removing or modifying any part of the existing installations and/or installing any new work.

1.21 RELOCATION OF EXISTING INSTALLATIONS

- A. There are portions of the existing plumbing, mechanical and electrical systems, which shall remain in use to serve the finished building in conjunction with the indicated new installations. By actual examination at the site, each bidder shall determine those

portions of the remaining present installations, which must be relocated to avoid interference with the installations of new work of his particular trade and that of all other trades. All such existing installations, which interfere with new installations, shall be relocated by the Contractor.

1.22 SALVAGE MATERIALS

- A. The Contractor shall remove existing fixtures, equipment and other items associated with the plumbing systems where no longer required for the project. Where such items are exposed to view or uncovered by any cutting or removal of general construction and has no continuing function (as determined by the Architect/Engineer), they shall be removed.
- B. All items or materials removed from the project shall be made available for the Owner's inspection. The Owner retains the option to claim any item or material. Contractor shall deliver any claimed item or material in good condition to the place designated by the Owner. All items not claimed become the property of the contractor and shall be removed from the site.

PART 2. PRODUCTS

2.01 MATERIALS

- A. All equipment shall be regularly cataloged items of the manufacturer and shall be supplied as a complete unit in accordance with the manufacturer's standard specifications along with any optional items required for proper installation unless otherwise noted. Maintain manufacturer's identification, model number, etc. on all equipment at all times.
- B. Where more than one of an item is to be provided, all of the items shall be identical manufacture, make, model, color, etc.

2.02 RESTRICTED MATERIALS

- A. No materials containing asbestos in any form shall be allowed.
- B. No solder or flux containing lead shall be used on this project.
- C. Any pipe or plumbing fitting or fixture, any solder, or any flux utilized on this project shall be "lead free" in accordance with the Safe Drinking Water Act, Section 1417. "Lead free" materials utilized in domestic water system shall not contain more than 0.2 percent lead when used with respect to solder and flux; and not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures. All materials utilized in domestic water system shall be certified by an ANSI accredited organization to conform to ANSI/NSF Standard 61.
- D. Where materials or equipment provided by this Contractor are found to contain restricted materials, such items shall be removed and replaced with non-restricted materials items. Entire cost of restricted materials removal and disposal and cost of installing new items shall be the responsibility of the Contractor for those restricted materials containing items installed by the Contractor.

2.03 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

- A. Plastic Nameplates: Laminated plastic with engraved letters.

- B. Plastic Tags: Laminated plastic with engraved letters, minimum 1-1/2 inches diameter.
- C. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering.
- D. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

2.04 PIPE HANGERS AND SUPPORTS

- A. Acceptable Manufacturers:
 - 1. Anvil.
 - 2. B-Line Systems, Inc.
 - 3. Erico.
 - 4. PHD Manufacturing, Inc.
 - 5. Tolco.
- B. Plumbing Piping - DWV:
 - 1. Conform to ANSI/MSS SP58.
 - 2. Hangers for Pipe Sizes ½ to 1-½ Inch: Malleable iron or carbon steel, adjustable swivel, split ring.
 - 3. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
 - 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - 5. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
 - 6. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
 - 7. Vertical Support: Steel riser clamp.
 - 8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 - 9. Copper Pipe Support: Carbon steel ring, adjustable, copper plated with neoprene isolation pad.
- C. Shield for Insulated Piping 1-½ Inches and Smaller: 18 gauge galvanized steel shield over insulation in 180° segments, minimum 12 inches long at pipe support.
- D. Shield for Insulated Piping 2 Inches and Larger: Hard block, calcium silicate insert, 180° segment, 12 inch minimum length, block thickness same as insulation thickness, flame resistant vapor barrier covering and 18 gauge galvanized shield.
- E. Shields for Vertical Copper Pipe Risers: Galvanized steel pipe.

2.05 HANGER RODS

- A. Steel Hanger Rods: Mild steel, threaded both ends, threaded one end, or continuous threaded. Minimum Hanger Rod Sizes:

PIPE AND TUBE SIZE (INCHES)	ROD SIZE (INCHES)
¼-4	3/8
5-8	1/2
10-12	5/8

2.06 EQUIPMENT CURBS

- A. Fabricate curbs of wood unless specifically called out otherwise.

2.07 FLASHING

- A. Metal Flashing: 26-gauge minimum galvanized steel.
- B. Metal Counter Flashing: 22-gauge minimum galvanized steel.
- C. Flexible Flashing: 47-mil thick sheet butyl, compatible with roofing.
- D. Caps: Steel, 22-gauge minimum; 16 gauge at fire resistant elements.

2.08 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Form with steel pipe or 18 gauge galvanized steel for 4 inch diameter and larger, 22 gauge up to 3" diameter.
- B. Sleeves for Pipes Through Fire Rated and Fire Resistive Floors and Walls, and Fireproofing: Prefabricated fire rated sleeves including seals, UL listed caulking system.
- C. Fire Stopping Insulation: Mineral fiber type, non- combustible.
- D. Caulk: Fire stop sealant in compliance with ASTM E814, UL 1479 and Division 7.
- E. Mechanical Sleeve Seals: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

PART 3. EXECUTION

3.01 DRAWINGS

- A. The drawings are partly diagrammatic, not necessarily showing all offsets or exact locations of piping and ducts, unless specifically dimensioned. The contractor shall provide all materials and labor necessary for a complete and operable system. Complete details of the building which affect the mechanical installation may not be shown. For additional details, see Architectural, Structural, Civil and Electrical Drawings. Coordinate work under this section with that of all related trades.

3.02 INSTALLATION

- A. All work shall comply with the latest adopted applicable codes and ordinances including, but not limited to, the IMC, UPC, IBC, NEC, NFPA, IECC, IFGC and IFC Standards; all local and state amendments to all codes and standards.
- B. Obtain and pay for all inspection fees, connection charges and permits as a part of the Contract.
- C. Compliance with codes and ordinances shall be at the Contractor's expense.

3.03 MEASUREMENTS

- A. Verify all measurements on the job site.
- B. Locate all equipment and fixtures on the centers of walls, openings, spaces, etc., unless specified otherwise.
- C. Check all piping, equipment, etc. to clear openings.
- D. Rough-in dimensions shall be per manufacturer's recommendations and in compliance with current ADA and ANSI 117.1 standards.

3.04 OPERATING INSTRUCTIONS

- A. Before the facility is turned over to the Owner, instruct the Owner or Owner's personnel in the operation, care and maintenance of all systems and equipment under the jurisdiction of the Plumbing Division. These instructions shall also be included in a written summary in the Operating Maintenance Manuals.
- B. The Operation and Maintenance Manuals shall be utilized for the basis of the instruction. Provide a minimum of four hours of onsite instruction to the owner designated personnel.
- C. When required by individual specification sections provide additional training on plumbing systems and equipment as indicated in the respective specification section.
- D. Provide schedule for training activities for review prior to start of training.

3.05 SYSTEM ADJUSTING

- A. Each part of each system shall be adjusted and readjusted as necessary to ensure proper functioning of all plumbing systems. Test all plumbing equipment, fixtures and piping for proper water distribution, drainage, pressure and flow, adjust systems as required to eliminate splashing, noise and vibration.

3.06 CUTTING, FITTING, REPAIRING, PATCHING AND FINISHING

- A. Arrange and pay for all cutting, fitting, repairing, patching and finishing of work by other trades where it is necessary to disturb such work to permit installation of mechanical work. Perform work only with craftsmen skilled in their respective trades.
- B. Avoid cutting, insofar as possible, by setting sleeves, frames, etc. and by requesting openings in advance. Assist other trades in securing correct location and placement of rough-frames, sleeves, openings, etc. for piping.
- C. Cut all holes neatly and as small as possible to admit work. Include cutting where sleeves or openings have been omitted. Perform cutting in a manner so as not to weaken walls, partitions or floors. Drill holes required to be cut in floors without breaking out around holes.

3.07 PAINTING

- A. Perform all of the following painting in accordance with provisions of Division 9 with colors as selected by the Architect. Provide the following items as a part of plumbing work:

1. Factory applied prime and finish coats on plumbing equipment.
2. Factory applied prime coat on access doors.
3. Pipe identification where specified.

B. If factory finish on any equipment furnished is damaged in shipment or during construction, refinish to equal original factory finish.

3.08 IDENTIFICATION

A. Identify piping to indicate contents and flow direction of each pipe exposed to view by a labeled sleeve in letters readable from floor at least once in each room and at intervals of not more than 20' apart and on each side of partition penetrations. Coloring scheme in accordance with ANSI A13.1-1981, Seton Opti-Code or equal.

3.09 PIPE HANGERS AND SUPPORTS

A. Support plumbing piping in accordance with the latest adopted edition of the UPC.

B. Support horizontal piping as follows:

MATERIALS	TYPES OF JOINTS	HORIZONTAL	VERTICAL
Cast-Iron Hub-less	Shielded Coupling	Every other joint, unless over 4 feet then support each joint ^{1,2,3,4}	Base and each floor, not to exceed 15 feet

Notes:

- ¹ Support adjacent to joint, not to exceed 18 inches.
- ² Brace not to exceed 40 foot intervals to prevent horizontal movement.
- ³ Support at each horizontal branch connection.
- ⁴ Hangers shall not be placed on the coupling.
- ⁵ Vertical water lines shall be permitted to be supported in accordance with recognized engineering principles with regard to expansion and contraction, where first approved by the Authority Having Jurisdiction.
- ⁶ See the appropriate IAPMO Installation Standard for expansion and other special requirements.
- ⁷ See manufacturer installation instructions for additional requirements.

C. Install hangers to provide minimum ½ inch space between finished covering and adjacent work.

D. Place a hanger within 12 inches of each horizontal elbow.

E. Use hangers with 1-½ inch minimum vertical adjustment.

F. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.

G. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.

H. Where several pipes can be installed in parallel and at the same elevation, provide multiple or trapeze hangers.

I. Support riser piping independently of connected horizontal piping.

J. Provide transverse seismic support for all piping systems.

3.10 FLASHING

- A. Provide flexible flashing and metal counter-flashing where piping penetrates weather or waterproofed walls, floors, and roofs.
- B. Flash vent pipes projecting 3 inches minimum above finished roof surface with pre-manufactured butyl boot.
- C. Seal floor drains watertight to adjacent materials.

3.11 SLEEVES

- A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- B. Set sleeves in position in construction. Provide reinforcing around sleeves.
- C. Extend sleeves through floors one inch above finished floor level. Caulk sleeves full depth and provide floor plate.
- D. Where piping penetrates floor, ceiling, or wall, install sleeve, close off space between pipe and adjacent work with fire stopping insulation and caulk seal. Use fire rated caulking where fire rated walls are penetrated. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- E. Install chrome plated steel escutcheons at finished surfaces.

END OF SECTION

SELECTIVE DEMOLITION FOR PLUMBING

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 DESCRIPTION

- A. Work specified in this Section includes the demolition, removal, and disposition of certain mechanical work.
- B. Drawings, the provisions of the Agreement, and Administrative Specification Sections apply to all work of this Section.

PART 2. PRODUCTS (Not Used)

PART 3. EXECUTION

3.01 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.
- B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of conditions as satisfactory.

3.02 DEMOLITION, REMOVAL AND DISPOSITION

- A. Piping and Equipment to Be Removed: Remove all piping and equipment as indicated on the Drawings.
- B. Piping Removed: Drawings do not show all existing piping which is to be removed. Unless indicated otherwise, where existing equipment has been removed, or its use replaced by

SELECTIVE DEMOLITION FOR PLUMBING

Division 22

Section 22 05 05

new equipment, remove connecting piping back to the branch in the main so that there will be no dead ends or unused pipe lines in mechanical spaces at completion.

- C. Piping, Equipment, and Control Wiring to Be Removed: Remove all piping, equipment, and control wiring as indicated. Drawings do not show all existing piping, equipment, and control wiring which is to be removed. Unless indicated otherwise, where existing equipment has been removed, or its use replaced by new equipment, remove connecting piping back to the branch in the main so that there will be no dead ends or unused pipe lines in mechanical spaces at completion.
- D. Materials to Owner: All items or materials removed from the project shall be made available for the Owner's inspection. The Owner retains the option to claim any item or material. The Contractor shall deliver any claimed item or material in good condition to the place designated by the Owner. All items not claimed become the property of the Contractor and shall be removed from the site by the Contractor.
- E. Materials to Owner: As indicated on the Drawings.
- F. Re-use of Materials: Only where indicated on Drawings.
- G. Materials to Contractor: Materials shown or specified to be removed, other than the materials indicated to be turned over to Owner.
- H. Protect any active piping and/or wiring encountered; remove, plug or cap utilities to be abandoned. Notify the Architect of utilities encountered whose service is not known.
- I. Debris Removal: Existing materials removed and not reinstalled or turned over to the Owner shall be immediately removed from the site and disposed of by the Contractor.
- J. Repairs: Any portion of the facility damaged, cut back or made inoperable by this Contractor shall be repaired with similar materials as the existing structure and/or damaged item as instructed by the Architect.

END OF SECTION

PLUMBING INSULATION

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Piping Insulation.
- B. Jackets and Accessories.

1.03 RELATED WORK

- A. Division 09 91 00 - Painting: Painting Insulation Jacket.
- B. Section 22 05 00 - Common Work Results for Plumbing.
- C. Section 22 40 00 - Plumbing Fixtures.

1.04 REFERENCES

- A. ASTM B209 - Aluminum and Aluminum-alloy Sheet and Plate.
- B. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- C. ANSI/ASTM C533 - Calcium Silicate Block and Pipe Thermal Insulation.
- D. ANSI/ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
- E. ASTM C450 - Standard Practice for Fabrication of Thermal Insulating Fitting Covers for NPS Piping, and Vessel Lagging.

- F. ANSI/ASTM C547 - Mineral Fiber Preformed Pipe Insulation.
- G. ANSI/ASTM C552 - Cellular Glass Block and Pipe Thermal Insulation.
- H. ANSI/ASTM C553 - Mineral Fiber Blanket and Felt Insulation.
- I. ANSI/ASTM C578 - Preformed, Block Type Cellular Polystyrene Thermal Insulation.
- J. ASTM C585 - Standard Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System).
- K. ANSI/ASTM C612 - Mineral Fiber Block and Board Thermal Insulation.
- L. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
- M. ASTM C1427 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
- N. ASTM D635 – Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
- O. ASTM E84 - Surface Burning Characteristics of Building Materials.
- P. ASTM E96 – Standard Test Methods for Water Vapor Transmission of Materials.
- Q. NFPA 255 - Surface Burning Characteristics of Building Materials.
- R. UL 723 - Surface Burning Characteristics of Building Materials.

1.05 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Include product description, thickness for each service, and locations.
- C. Submit manufacturer's installation instructions.

1.06 QUALITY ASSURANCE

- A. Applicator: Company specializing in piping insulation application with three years minimum experience.
- B. Pipe insulation manufactured in accordance with ASTM C585 for inner and outer diameters.
- C. Materials: Flame spread/smoke developed rating of 25/50 in accordance with UL 723, ASTM E84, or NFPA 255.
- D. Factory fabricated fitting covers manufactured in accordance with ASTM C450.

1.07 DELIVERY STORAGE AND HANDLING

- A. Division 1 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- C. Shipment of materials from manufacturer to installation location shall be in weather tight transportation.
- D. Protect insulation from weather and construction traffic, dirt, water, chemical, and damage, by storing in original wrapping.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.

1.09 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.10 WARRANTY

- A. Division 1 - Execution and Closeout Requirements: Product warranties and product bonds.

PART 2. PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Armacell.
- B. Certain-Teed.
- C. IMCOA.
- D. Johns Manville.
- E. Knauf.
- F. Owens-Corning.
- G. Manson.
- H. Nomaco.
- I. Pittsburgh - Corning.
- J. K-Flex USA.
- K. Armstrong.

- L. TRUEBRO.
- M. Substitutions: Under provisions of Division 1.

2.02 INSULATION - PIPING

- A. Type A: Glass fiber, rigid, molded, non-combustible insulation; ANSI/ASTM C547; 'k' value of 0.23 at 75° F, rated from 0° F to 850° F, vapor retarder jacket of Kraft paper bonded to aluminum foil, self-sealing lap and butt strips; Johns Manville "Micro-Lok" or approved equal.
- B. Type C: Expanded polystyrene; ANSI/ASTM C578; rigid closed cell; maximum water vapor transmission rating of 0.1 perms; 'k' value of 0.23 at 75° F.

2.03 FIELD APPLIED JACKET

- A. Vapor Barrier Jackets: Kraft reinforced foil vapor barrier with self-sealing adhesive joints.
- B. PVC Jackets and solvent welding adhesive: One piece, pre-molded type, Johns Manville "Zeston 2000", fitting covers and jacketing material. Johns Manville "Perma-Weld" solvent welding adhesive.
- C. Aluminum Jackets: ASTM B209; 0.016 inch thick; corrugated or textured finish, longitudinal slip joints.
- D. Stainless Steel Jackets: Type 304 stainless steel; 0.010 inch thick; corrugated finish.
- E. Re-Wettable Canvas Jacketing: , Fiberglass cloth made from texturized yarns, impregnated throughout with an inorganic fire retardant asbestos free adhesive; 20x14 thread count, 14.5 oz./sq.yd, 0.04 inch thickness, 1,000° F upper temperature limit; GLT Products "Style 1989" or approved equal.

2.04 INSULATION ACCESSORIES

- A. Adhesives: Waterproof and fire-retardant type.
- B. Canvas Lagging Adhesive: Fire resistive to NFPA 255.
- C. Impale Anchors: Galvanized steel, 12 gauge, self-adhesive pad.
- D. Joint Tape: Glass fiber cloth, open mesh.
- E. FSK Joint Tape; ASTM C1136 Foil-Scrim-Kraft (FSK) lamination coated with solvent acrylic pressure sensitive adhesive; capable of adhering to fibrous and sheet metal surfaces; tri-directionally reinforced 2x3 squares per inch fiberglass scrim; 9.5 mils thick, - 40 to 240° F service temperatures; Venture Tape "1525CW" or approved equal.
- F. Tie Wire: Annealed steel, 16 gauge.
- G. Insulated pipe supports: Calcium silicate with galvanized steel jacket (min. 24 gauge); ANSI/ASTM C533; rigid white; 'k' value of 0.37 at 100° F, rated to 1,200° F; Thermal Pipe Shields "T-1000 Calsil" or equal.

PART 3. EXECUTION

3.01 PREPARATION

- A. Install materials after piping and equipment has been tested and approved.
- B. Clean surfaces for adhesives.
- C. Prepare surfaces in accordance with manufacturer's recommendations.

3.02 INSTALLATION - PIPING

- A. Install materials in accordance with manufacturer's recommendations, building codes and industry standards.
- B. Continue insulation vapor barrier through penetrations except where prohibited by code.
- C. Locate insulation and cover seams in least visible locations.
- D. Neatly finish insulation at supports, protrusions, and interruptions.
- E. Provide insulated cold pipes conveying fluids below ambient temperature with vapor retardant jackets with self-sealing laps. Insulate complete system, including under fitting jackets.
- F. For insulated pipes conveying fluids above ambient temperature, secure jackets with self-sealing lap or outward clinched, expanded staples. Bevel and seal ends of insulation at equipment, flanges, and unions. Insulate complete system, including under fitting jackets.
- G. Provide insulated piping inserts on piping 1-1/2" inches diameter or larger. Insulation inserts shall not be less than the following lengths:

1-1/2" to 2-1/2" pipe size	10" long
3" to 6" pipe size	12" long
- H. For exterior applications, provide weather protection jacket or coating. Insulated pipe, fittings, joints, and valves shall be covered with PVC or metal jacket. Jacket seams shall be located on bottom side of horizontal piping.
- I. Fully insulate all piping including all spaces under jacketing.
- J. Jackets:
 - 1. Indoor, Concealed Applications: Insulated pipes shall have vapor barrier jackets, factory-applied. Vapor barrier PVC fittings may also be used provided joints are sealed with solvent welding adhesive approved by the jacket manufacturer.
 - 2. For pipe exposed in mechanical equipment rooms or in finished spaces below 10 feet above finished floor, finish with PVC jacket and fitting covers or metal jacket.
 - 3. Insulate all exposed trap arms, drains, and hot water supplies for handicap protection on handicap accessible fixtures.

3.03 SCHEDULE - PIPING

PLUMBING INSULATION

Division 22

Section 22 07 00

PIPING	TYPE	PIPE SIZE Inch	MINIMUM INSULATION THICKNESS Inch
Rain Leaders	A, C	All Sizes	1"
Roof Drain Sumps	A, C	All Sizes	2"

END OF SECTION

PLUMBING PIPING

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 WORK INCLUDED

- A. Storm Drain Piping.

1.03 RELATED WORK

- A. Division 2 – Site Construction
- B. Section 22 05 00 – Common Work Results for Plumbing.
- C. Section 22 07 00 - Plumbing Insulation.
- D. Section 22 40 00 - Plumbing Fixtures.

1.04 QUALITY ASSURANCE

- A. Valves: Manufacturer's name and pressure rating marked on valve body.
- B. Any pipe or plumbing fitting or fixture, any solder, or any flux utilized on this project shall be "lead free" in accordance with the Safe Drinking Water Act, Section 1417. "Lead free" materials utilized in domestic water system shall not contain more than 0.2 percent lead when used with respect to solder and flux; and not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures. All materials utilized in domestic water system shall be certified by an ANSI accredited organization to conform to ANSI/NSF Standard 61.
- C. Welding Materials and Procedures: Conform to ASME Code and applicable state labor regulations.

- D. Welders Certification: In accordance with ANSI/ASME Sec 9.

1.05 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Include data on pipe materials, pipe fittings, valves and accessories.

1.06 WARRANTY

- A. Polypropylene pipe and fittings shall be covered by a factory warranty for 30 years to be free of defects in materials or manufacturing.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site under provisions of Division 1.
- B. Store and protect products under provisions of Division 1.
- C. Deliver and store valves in shipping containers with labeling in place.

PART 2. PRODUCTS

2.01 STORM DRAIN PIPING, ABOVE GRADE

- A. Cast Iron Pipe: CISPI 301, hubless, service weight. Fittings: Cast iron. Joints: Neoprene gaskets and stainless-steel clamp-and-shield assemblies, Husky Series 4000 or approved equal.

2.02 FLANGES, UNIONS, AND COUPLINGS

- A. Pipe Size 2 Inches and Under: 150 psig malleable iron unions for threaded ferrous piping; bronze unions for copper pipe, soldered joints.
- B. Pipe Size Over 2 Inches: 150 psig forged steel slip-on flanges for ferrous piping; bronze flanges for copper piping; 1/16 inch thick preformed neoprene bonded to fiber.
- C. Grooved and Shouldered Pipe End Couplings: Malleable iron housing clamps to engage and lock, designed to permit some angular deflection, contraction, and expansion; "C" shape composition sealing gasket; steel bolts, nuts, and washers; galvanized couplings for galvanized pipe.

PART 3. EXECUTION

3.01 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.

3.02 INSTALLATION

- A. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

- B. Route piping in orderly manner and maintain gradient.
- C. Install piping to conserve building space and not interfere with use of space.
- D. Group piping whenever practical at common elevations.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Provide clearance for installation of insulation and access to valves and fittings.
- G. Provide access where valves and fittings are not exposed. Coordinate size and location of access doors.
- H. Slope water piping and arrange to drain at low points.
- I. Establish elevations of buried piping outside the building to ensure not less than 10 ft. of cover.
- J. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- K. Prepare pipe, fittings, supports, and accessories not prefinished, ready for finish painting. Refer to Division 9.
- L. Establish invert elevations, slopes for drainage to 1/4" per foot, 1/8" per foot if 4" or over, minimum. Maintain gradients.
- M. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with Teflon™ based thread lubricate. Ensure clearance at cleanout for rodding of drainage system.
- N. Support all piping in accordance with Uniform Plumbing Code and Manufacturer installation instructions. Where there is a conflict between requirements of the Uniform Plumbing Code and Manufacturer installation instructions, the more restrictive requirement shall apply.

3.03 TESTING

- A. Test all storm drainage piping in accordance with Section 1109 of the UPC. Submit a signed statement to the Engineer stating testing dates, procedure and initials of tester.

END OF SECTION

PLUMBING FIXTURES

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 WORK INCLUDED

- A. Roof Drains.

1.03 RELATED WORK

- A. Section 22 05 00 - Common Work Results for Plumbing.
- B. Section 22 10 00 – Plumbing Piping.

1.04 REFERENCES

- A. ANSI A112.21.2 - Roof Drains.

1.05 QUALITY ASSURANCE

- A. Manufacturer: For each product specified, provide components by same manufacturer throughout.
- B. Trim: By same manufacturer for each product specified throughout.

1.06 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Include sizes, rough-in requirements, service sizes, and finishes.

1.07 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Division 1.
- B. Include fixture trim exploded view and replacement parts lists.
- C. Provide Manufacturer's parts list and maintenance information on specialties.

1.08 WARRANTY

- A. Provide manufacturer's warranty under provisions of Division 1.

PART 2. PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - ROOF DRAINS, AND ACCESSORIES

- A. J.R. Smith.
- B. Zurn.
- C. Josam.
- D. Mifab.
- E. Substitutions: Under provisions of Division 1.

2.02 ROOF DRAINS

- A. Roof Drains (RD-1): ANSI A112.21.2; lacquered cast iron body with sump, vandal proof removable cast iron dome strainer, membrane flange and membrane clamp with integral gravel stop, with adjustable underdeck clamp, roof sump receiver, waterproofing flange, leveling frame, adjustable extension sleeve. Model 1015 manufactured by J.R. Smith.

PART 3. EXECUTION

3.01 PREPARATION

- A. Coordinate forming of roof construction to receive drains to required invert elevations.

3.02 INSPECTION

- A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.
- B. Verify adjacent construction is ready to receive rough-in work of this Section.

3.03 INSTALLATION

- A. Install components level and plumb.
- B. Install and secure fixtures in place with wall or floor carriers, supports as per the manufacturer's instructions.

- C. Install specialties in accordance with manufacturer's instructions to permit intended performance.
- D. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.

END OF SECTION

COMMON WORK RESULTS FOR HVAC

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SCOPE

- A. All provisions of the Contract including the General and Supplementary Conditions and the General Requirements apply to this work.

1.03 WORK INCLUDED

- A. The work to be included in these and all other mechanical subsections shall consist of providing, installing, adjusting and setting into proper operation complete and workable systems for all items shown on the drawings, described in the specifications or reasonably implied. This shall include the planning and supervision to coordinate the work with other crafts and to maintain a proper time schedule for delivery of materials and installation of the work.
- B. Division 1 of the specifications is to be specifically included as well as all related drawings.

1.04 RELATED WORK

- A. Related Work Specified Elsewhere:
 - 1. Plumbing Specifications: Division 22.
 - 2. Electrical Specifications: Division 26.
- B. Unless otherwise indicated on the electrical drawings or the electrical schedules, provide all mechanical equipment motors, motor starters, thermal overload switches, control relays, time clocks, thermostats, motor operated valves, float controls, damper motors, electric switches, electrical components, wiring and any other miscellaneous Division 23

controls. Disconnect switches are included in the electrical work, unless specifically called out on mechanical plans.

- C. Carefully coordinate all work with the electrical work shown and specified elsewhere.

1.05 REFERENCED CODES - LATEST ADOPTED EDITION

- A. NFPA 70 National Electrical Code (NEC).
- B. IMC International Mechanical Code.
- C. UPC Uniform Plumbing Code.
- D. IECC International Energy Conservation Code.
- E. IBC International Building Code.

1.06 PROJECT RECORD DRAWINGS

- A. In addition to other requirements of Division 1, mark up a clean set of drawings as the work progresses to show the dimensioned location and routing of all mechanical work which will become permanently concealed. Show routing of work in concealed blind spaces within the building. Show exact dimensions of buried piping off of columns or exterior walls.
- B. Maintain record documents at job site in a clean, dry and legible condition. Keep record documents available for inspection by the Project Manager.
- C. Show the location of all valves and their appropriate tag identification.
- D. At completion of project, deliver these drawings to the Engineer and obtain a written receipt.

1.07 SUBMITTALS

- A. See General Conditions and the General Requirements in Division 1 regarding submittals.
- B. Submit by specification section complete and all at one time; partial submittals will not be considered. Submittals shall be provided in electronic PDF Format. The data in the electronic file shall be arranged and indexed under basic categories in order of the Specification Sections. An index shall be included with bookmarks and identifying tabs between sections and references to sections of specifications.
- C. Catalog sheets shall be complete and the item or model to be used shall be clearly marked, and identified as to which item in the specifications or on the drawings is being submitted and with drawing fixture number where applicable.
- D. Only submit on items specifically required by each specification section. If a submittal has not been requested, it will not be reviewed.
- E. Submit product data for:
 - 1. Hangers and Supports for HVAC Piping and Equipment.

2. Vibration and Seismic controls for HVAC Piping, Ductwork and Equipment.
3. Identification for HVAC Piping, Ductwork and Equipment.

1.08 OPERATING AND MAINTENANCE MANUALS

- A. Submit maintenance manuals to the Engineer covering all equipment, devices, etc. installed by the Contractor.
- B. The operation and maintenance manuals shall be submitted by specification section complete and all at one time; partial operations and maintenance manual submittals will not be considered. The Operation and maintenance manuals shall be provided in electronic PDF Format. The data in the electronic file shall be arranged and indexed under basic categories. An index shall be included with bookmarks and identifying tabs between sections and references to sections of specifications. The manual shall contain, but not limited to, the following types of information:
 1. Cover sheet with name, address, telephone number of Contractor, General Contractor and major equipment suppliers.
 2. Catalog cuts of all equipment, etc. installed (Marked to identify the specific items used).
 3. Manufacturer's maintenance and overhaul instruction booklets including exploded views.
 4. Identification numbers of all parts and nearest sources for obtaining parts and services.
 5. Reduced scale drawings of the control system and a verbal description of how these controls operate.
 6. A copy of the final test and balance report.
 7. A copy of valve schedule and reduced scale drawings showing valve locations.
 8. Written summary of instructions to Owner.
 9. All manufacturers' warranties and guarantees.
 10. Contractors Warranty Letter.
- C. A periodic maintenance form that includes all of the equipment shall be provided with the maintenance manual. The form shall list each piece of equipment and how often maintenance is required (daily, weekly, monthly, annually). Opposite each task shall be squares for check-off for a full year (initials) to verify that the tasks are being done.

1.09 HANDLING

- A. See General Conditions and the General Requirements in Division 1 regarding material handling.
- B. Deliver packaged materials to job site in unbroken packages with manufacturer's label, and store to facilitate inspection and installation sequence. All items must be labeled and identified as to make, size and quality.

1.10 SUBSTITUTIONS

- A. See General Conditions and the General Requirements in Division 1 for substitution request procedures.
- B. In accordance with the General Conditions and the General Requirements in Division 1, Substitution and Product Options, all substitute items must fit in the available space, and be of equal or better quality including efficiency performance, size, and weight, and must

be compatible with existing equipment. The Engineer shall be the final authority regarding acceptability of substitutes.

1.11 DIMENSIONS

- A. Before ordering any material or doing any work, the Contractor shall verify all dimensions, including elevations, and shall be responsible for the correctness of the same. No extra charge or compensation will be allowed on account of differences between actual dimensions and measurements indicated on the drawings.
- B. Any differences, which may be found, shall be submitted to the Engineer for consideration before proceeding with the work.

1.12 MANUFACTURER'S DIRECTIONS

- A. All manufactured articles shall be applied, installed and handled as recommended by the manufacturer, unless specifically called out otherwise. Advise the Architect/Engineer of any such conflicts before installation.

1.13 PERMITS, FEES, ETC.

- A. The Contractor under each Division of these specifications shall arrange for a permit from the local authority. The Contractor shall pay for any inspection fees or other fees and charges required by ordinance, law, codes and these specifications.

1.14 TESTING

- A. The Contractor under each section shall at his own expenses perform the various tests as specified and required by the Architect and as required by applicable code, the State and local authorities. The Contractor shall furnish all fuel and materials necessary for making tests.

1.15 TERMINOLOGY

- A. Whenever the words "furnish", "provide", "furnish and install", "provide and install", and/or similar phrases occur, it is the intent that the materials and equipment described be furnished, installed and connected under this Division of the Specifications, complete for operation unless specifically noted to the contrary.
- B. Where a material is described in detail, listed by catalogue number or otherwise called for, it shall be the Contractor's responsibility to furnish and install the material.
- C. The use of the word "shall" conveys a mandatory condition to the contract.
- D. "This section" refers to the section in which the statement occurs.
- E. "The project" includes all work in progress during the construction period.
- F. In describing the various items of equipment, in general, each item will be described singularly, even though there may be a multiplicity of identical or similar items.

1.16 SCHEDULE OF WORK

- A. The work under the various sections must be expedited and close coordination will be required in executing the work. The various trades shall perform their portion of the work at such times as directed so as to meeting scheduled completion dates, and to avoid delaying any other trade. The Architect will set up completion dates. Each contractor shall cooperate in establishing these times and locations and shall process his work so as to ensure the proper execution of it.

1.17 COOPERATION AND CLEANING UP

- A. The contractor for the work under each section of the specifications shall coordinate his work with the work described in all other sections of the specifications to the end that, as a whole, the job shall be a finished one of its kind, and shall carry on his work in such a manner that none of the work under any section of these specifications shall be handicapped, hindered or delayed at any time.
- B. At all times during the progress of the work, the Contractor shall keep the premises clean and free of unnecessary materials and debris. The Contractor shall, on direction at any time from the Architect, clear any designated areas or area of materials and debris. On completion of any portion of the work, the Contractor shall remove from the premises all tools and machinery and all debris occasioned by the work, leaving the premises free of all obstructions and hindrances.

1.18 WARRANTY

- A. Unless a longer warranty is hereinafter called for, all work, materials and equipment items shall be warrantied for a period of one year after acceptance by the Owner. All defects in labor and materials occurring during this period, as determined by the Architect/Engineer, shall be repaired and/or replaced to the complete satisfaction of the Architect/Engineer. Guarantee shall be in accordance with Division 1.

1.19 COMPLETION REQUIREMENTS

- A. In accordance with the General Conditions and the General Requirements in Division 1, Project Closeout; before acceptance and final payment, the Contractor shall furnish:
1. Accurate project record drawings, shown in red ink on prints, showing all changes from the original plans made during installation of the work.
 2. Contractors One Year Warranty.
 3. All Manufacturers' Guarantees.
 4. Test and Balance Reports.
 5. Operation and Maintenance Manuals.

1.20 INSPECTION OF SITE - REMODEL PROJECTS

- A. The accompanying plans do not indicate completely the existing plumbing and mechanical installations. The bidders for the work under these sections of the specifications shall inspect the existing installations and thoroughly acquaint themselves with conditions to be met and the work to be accomplished in removing and modifying the existing work, and in installing the new work in the present building and underground serving to and from that structure. Failure to comply with this shall not constitute grounds for any additional payments in connection with removing or modifying any part of the existing installations and/or installing any new work.

1.21 RELOCATION OF EXISTING INSTALLATIONS

- A. There are portions of the existing plumbing, mechanical and electrical systems, which shall remain in use to serve the finished building in conjunction with the indicated new installations. By actual examination at the site, each bidder shall determine those portions of the remaining present installations, which must be relocated to avoid interference with the installations of new work of his particular trade and that of all other trades. All such existing installations, which interfere with new installations, shall be relocated by the Contractor.

1.22 SALVAGE MATERIALS

- A. The Contractor shall remove existing equipment, duct, grilles and other items associated with the mechanical systems where no longer required for the project. Where such items are exposed to view or uncovered by any cutting or removal of general construction and has no continuing function (as determined by the Architect/Engineer), they shall be removed.
- B. All items or materials removed from the project shall be made available for the Owner's inspection. The Owner retains the option to claim any item or material. Contractor shall deliver any claimed item or material in good condition to the place designated by the Owner. All items not claimed become the property of the contractor and shall be removed from the site.

PART 2. PRODUCTS

2.01 MATERIALS

- A. All equipment shall be regularly cataloged items of the manufacturer and shall be supplied as a complete unit in accordance with the manufacturer's standard specifications along with any optional items required for proper installation unless otherwise noted. Maintain manufacturer's identification, model number, etc. on all equipment at all times.
- B. Where more than one of an item is to be provided, all of the items shall be identical manufacture, make, model, color, etc.

2.02 RESTRICTED MATERIALS

- A. No materials containing asbestos in any form shall be allowed.
- B. No solder or flux containing lead shall be used on this project.
- C. Where materials or equipment provided by this Contractor are found to contain restricted materials, such items shall be removed and replaced with non-restricted materials items. Entire cost of restricted materials removal and disposal and cost of installing new items shall be the responsibility of the Contractor for those restricted materials containing items installed by the Contractor.

2.03 IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

- A. Plastic Nameplates: Laminated plastic with engraved letters.
- B. Plastic Tags: Laminated plastic with engraved letters, minimum 1-1/2 inches diameter.

2.04 FLASHING

- A. Metal Flashing: 26-gauge minimum galvanized steel.
- B. Metal Counter Flashing: 22-gauge minimum galvanized steel.
- C. Flexible Flashing: 47-mil thick sheet butyl, compatible with roofing.
- D. Caps: Steel, 22-gauge minimum; 16 gauge at fire resistant elements.

2.05 EQUIPMENT CURBS

- A. Fabricate curbs of wood, unless specifically called out otherwise.

2.06 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Form with steel pipe or 18 gauge galvanized steel for 4 inch diameter and larger, 22 gauge up to 3" diameter.
- B. Sleeves for Pipes Through Fire Rated and Fire Resistive Floors and Walls, and Fireproofing: Prefabricated fire rated sleeves including seals, UL listed caulking system.
- C. Fire Stopping Insulation: Mineral fiber type, non- combustible.
- D. Caulk: Fire stop sealant in compliance with ASTM E814, UL 1479 and Division 7.
- E. Mechanical Sleeve Seals: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.07 FORMED STEEL CHANNEL

- A. Manufacturers:
 - 1. Allied Tube & Conduit Corp.
 - 2. B-Line Systems.
 - 3. Midland Ross Corporation, Electrical Products Division
 - 4. Unistrut Corp.
 - 5. Substitutions under provisions of Division 01.
- B. Product Description: Galvanized 12 gauge (2.8 mm) thick steel. With holes 1-1/2 inches (38 mm) on center.

2.08 VENTILATING SYSTEMS FLEXIBLE CONNECTIONS

- A. Fabricate of neoprene coated flameproof fabric a minimum of 3" wide tightly crimped into metal edging strip and attach to ducting and equipment by screws or bolts at 6" intervals. DuroDyne Dynalon treated duct material, or equal. Durolon or equal for outdoor or high pressure applications.

PART 3. EXECUTION

3.01 DRAWINGS

- A. The drawings are partly diagrammatic, not necessarily showing all offsets or exact locations of piping and ducts, unless specifically dimensioned. The contractor shall provide all materials and labor necessary for a complete and operable system. Complete details of the building which affect the mechanical installation may not be shown. For additional details, see Architectural, Structural, Civil and Electrical Drawings. Coordinate work under this section with that of all related trades.

3.02 INSTALLATION

- A. All work shall comply with the latest adopted applicable codes and ordinances including, but not limited to, the IMC, UPC, IBC, NFPA, and IECC Standards; all local and state amendments to all codes and standards.
- B. Obtain and pay for all inspection fees, connection charges and permits as a part of the Contract.
- C. Compliance with codes and ordinances shall be at the Contractor's expense.
- D. Install in accordance with manufacturer's instructions.

3.03 MEASUREMENTS

- A. Verify all measurements on the job site.
- B. Locate all equipment on the centers of walls, openings, spaces, etc., unless specified otherwise.
- C. Check all piping, ducts, etc. to clear openings.
- D. Rough-in dimensions shall be per manufacturer's recommendations and in compliance with current ADA and ANSI 117.1 standards.

3.04 OPERATING INSTRUCTIONS

- A. Before the facility is turned over to the Owner, instruct the Owner or Owner's personnel in the operation, care and maintenance of all systems and equipment under the jurisdiction of the Mechanical Division. These instructions shall also be included in a written summary in the Operating Maintenance Manuals.
- B. The Operation and Maintenance Manuals shall be utilized for the basis of the instruction. Provide a minimum of four hours of on-site instruction to the owner designated personnel.
- C. When required by individual specification sections provide additional training on HVAC systems and equipment as indicated in the respective specification section.
- D. Provide schedule for training activities for review prior to start of training.

3.05 SYSTEM ADJUSTING

- A. Each part of each system shall be adjusted and readjusted as necessary to ensure proper functioning of all controls, proper air distribution, elimination of drafts, noise and vibration.
- B. Balance air and water systems for volume quantities shown and as required to ensure even temperature and the elimination of drafts. Balancing shall be done by a qualified firm acceptable to the Engineer. Provide balancing log to the Engineer before substantial completion.

3.06 CUTTING, FITTING, REPAIRING, PATCHING AND FINISHING

- A. Arrange and pay for all cutting, fitting, repairing, patching and finishing of work by other trades where it is necessary to disturb such work to permit installation of mechanical work. Perform work only with craftsmen skilled in their respective trades.
- B. Avoid cutting, insofar as possible, by setting sleeves, frames, etc. and by requesting openings in advance. Assist other trades in securing correct location and placement of rough-frames, sleeves, openings, etc. for ducts and piping.
- C. Cut all holes neatly and as small as possible to admit work. Include cutting where sleeves or openings have been omitted. Perform cutting in a manner so as not to weaken walls, partitions or floors. Drill holes required to be cut in floors without breaking out around holes.

3.07 PAINTING

- A. Perform all of the following painting in accordance with provisions of Division 9 with colors as selected by the Architect. Provide the following items as a part of mechanical work:
 - 1. Factory applied prime and finish coats on mechanical equipment.
 - 2. Factory applied prime and finish coat on all air registers, grilles and diffusers, unless otherwise specified.
 - 3. Factory applied prime coat on access doors.
 - 4. Pipe identification where specified.
- B. If factory finish on any equipment furnished is damaged in shipment or during construction, refinish to equal original factory finish.

3.08 IDENTIFICATION

- A. Label all equipment with heat resistant laminated plastic labels having engraved lettering ½" high. If items are not specifically listed on the schedules, consult the Engineer concerning designation to use. Seton engraved Seton-Ply nameplates or equal.

3.09 FLASHING

- A. Provide flexible flashing and metal counter-flashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Provide acoustical flashing around ducts and pipes penetrating equipment rooms, installed in accordance with manufacturer's instructions for sound control.

- C. Provide curbs for mechanical roof installations 16 inches minimum high above roofing surface. Flexible sheet flash and counter-flash with sheet metal; seal watertight.
- D. Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

3.10 SLEEVES

- A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- B. Set sleeves in position in construction. Provide reinforcing around sleeves.
- C. Extend sleeves through floors one inch above finished floor level. Caulk sleeves full depth and provide floor plate.
- D. Where piping or ductwork penetrates floor, ceiling, or wall, install sleeve, close off space between pipe or duct and adjacent work with fire stopping insulation and caulk seal. Use fire rated caulking where fire rated walls are penetrated. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- E. Install chrome plated steel escutcheons at finished surfaces.

3.11 INSTALLATION OF EQUIPMENT

- A. Unless otherwise indicated, mount all equipment and install in accordance with manufacturer's recommendations and approved submittals.
- B. Maintain manufacture recommended minimum clearances for access and maintenance.
- C. Where equipment is to be anchored to structure, furnish and locate necessary anchoring and vibration isolation devices.
- D. Furnish all structural steel, such as angles, channels, beams, etc. required to support all piping, ductwork, equipment and accessories installed under this Division. Use structural supports suitable for equipment specified or as indicated. In all cases, support design will be based upon data contained in manufacturer's catalog.
- E. Openings: Arrange for necessary openings in buildings to allow for admittance and reasonable maintenance or replacement of all equipment furnished under this Contract.
- F. Access Doors: Provide as necessary for reasonable maintenance of all equipment valves, controls, etc.

END OF SECTION

SELECTIVE DEMOLITION FOR HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 DESCRIPTION

- A. Work specified in this Section includes the demolition, removal, and disposition of certain mechanical work.
- B. Drawings, the provisions of the Agreement, and Administrative Specification Sections apply to all work of this Section.

PART 2. PRODUCTS (Not Used)

PART 3. EXECUTION

3.01 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.
- B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of conditions as satisfactory.

3.02 DEMOLITION, REMOVAL AND DISPOSITION

- A. Piping, Ductwork, And Equipment To Be Removed: Remove all piping, ductwork, and equipment as indicated on the Drawings.
- B. Piping Removed: Drawings do not show all existing piping which is to be removed. Unless indicated otherwise, where existing equipment has been removed, or its use replaced by

SELECTIVE DEMOLITION FOR HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

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new equipment, remove connecting piping back to the branch in the main so that there will be no dead ends or unused pipe lines in mechanical spaces at completion.

- C. Piping, Ductwork, Equipment, Control Wiring and Tubing To Be Removed: Remove all piping, ductwork, equipment, control wiring and tubing as indicated. Drawings do not show all existing piping, ductwork, equipment, control wiring and tubing which is to be removed. Unless indicated otherwise, where existing equipment has been removed, or its use replaced by new equipment, remove connecting piping and ductwork back to the branch in the main so that there will be no dead ends or unused pipe lines in mechanical spaces at completion.
- D. Materials To Owner: All items or materials removed from the project shall be made available for the Owner's inspection. The Owner retains the option to claim any item or material. The Contractor shall deliver any claimed item or material in good condition to the place designated by the Owner. All items not claimed become the property of the Contractor and shall be removed from the site by the Contractor.
- E. Materials To Owner: As indicated on the Drawings.
- F. Re-use Of Materials: Only where indicated on Drawings.
- G. Materials To Contractor: Materials shown or specified to be removed, other than the materials indicated to be turned over to Owner.
- H. Protect any active piping and/or wiring encountered; remove, plug or cap utilities to be abandoned. Notify the Architect of utilities encountered whose service is not known.
- I. Debris Removal: Existing materials removed and not reinstalled or turned over to the Owner shall be immediately removed from the site and disposed of by the Contractor.
- J. Repairs: Any portion of the facility damaged, cut back or made inoperable by this Contractor shall be repaired with similar materials as the existing structure and/or damaged item as instructed by the Architect.

END OF SECTION

TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 WORK INCLUDED

- A. Hydronic Systems.

1.03 SCOPE

- A. Furnish the professional services of a qualified and approved balancing and testing firm to perform the work of this specification section.
- B. The work of this section includes but is not necessarily limited to:
 - 1. Testing and balancing existing hydronic heating and ventilation systems as indicated on drawings.
 - 2. Testing and balancing fans and air handling systems.
 - 3. Testing and balancing new variable air volume terminal units.
 - 4. Working directly with the control subcontractor to obtain proper system adjustments.
 - 5. Domestic water distribution system adjustment.
- C. The work of this section does not include:
 - 1. Adjusting burners for proper combustion operation.
 - 2. Liquid waste transfer system adjustment.
 - 3. Fire protection systems.

1.04 APPLICABLE CODES AND STANDARDS

- A. SMACNA Manual for the Balancing and Adjustment of Air Distribution Systems.
- B. AMCA Publication 203, Field Performance Measurements.
- C. American Air Balancing Council (AABC) Recommended Procedures
- D. National Environmental Balancing Bureau (NEBB) Recommended Procedures

1.05 QUALIFICATION OF THE BALANCING FIRM OR COMPANY

- A. Subcontractor minimum qualifications include:
 - 1. NEBB Certified in Testing, Adjusting and Balancing of Air and Hydronic Systems or Demonstration of satisfactory completion of five projects of similar scope in the State of Alaska during the past five years. Provide references if requested.

1.06 TIMING OF WORK

- A. Do not begin balancing and testing until the systems, including controls, are completed and in full working order.
- B. Schedule the testing and balancing work in cooperation with other trades.
- C. Complete the testing and balancing at least one week before the date of substantial completion and before any occupancy occurs

1.07 CONTRACTOR RESPONSIBILITY TO BALANCING AGENCY

- A. Award the test and balance contract to an approved firm or company upon receipt of contract to allow the Balance and Testing Agency to schedule this work in cooperation with other trades involved and comply with completion date.
- B. Put all heating, ventilating and air conditioning systems, equipment and controls into full operation for the Balancing Agency and continue the operation of same during each working day of testing balancing.
- C. Provide scaffolding, ladders and access to each system for proper testing balancing.
- D. Ensure that the building enclosure is complete, including but not limited to, structural components, windows and doors installed, door hardware complete, ceilings complete, stair, elevator and mechanical shafts complete, roof systems complete, all plenums sealed, etc.
- E. Make any changes in pulleys, belts and dampers, or add any dampers as required for correct balance as recommended by the Balance and Testing Agency at no additional cost to the Owner.
- F. Complete installation, programming (including design parameters and graphics),

calibration, and startup of all building control systems.

- G. Require that the building control system firm provide access to hardware and software, or onsite technical support required to assist the TAB effort. The hardware and software or the onsite technical support shall be provided at no cost to the TAB firm.

1.08 REPORT

- A. Certified Reports shall be included in project O & M manuals. Reports shall include: testing, adjusting, and balancing reports bearing the signature of the Test and Balance Agency Representative. The reports shall be certified proof that the systems have been tested, adjusted, and balanced in accordance with the referenced standards; are an accurate representation of how the systems have been installed; are a true representation of how the systems are operating at the completion of the testing, adjusting and balancing procedures; and are an accurate record of all final quantities measured, to establish normal operating values of the system. Follow the procedures and format specified below:
 - 1. Draft Reports: Upon completion of testing, adjusting and balancing procedures, prepare draft reports on the approved forms. Draft reports may be hand written, but must be complete, factual, accurate, and legible. Organize and format draft reports in the same manner specified for the final reports.
 - 2. Final Reports: Upon verification and approval of the draft report; prepare final reports, typewritten, organized and formatted as specified below.
 - 3. Report Format: Report forms shall be those standard forms prepared by the referenced standard for each respective item and system to be tested, adjusted and balanced. Report shall be provided in electronic PDF Format. The data in the electronic file shall be arranged and indexed. Divide the contents into the below listed sections, with bookmarks for each section:
 - a. General Information and Summary.
 - b. Air Systems.
 - c. Hydronic Systems.
 - d. Temperature Control Systems.
 - e. Special Systems.
 - f. System Deficiency Reports and Corrective Actions.
 - 4. Report Contents: Provide the following minimum information, forms and data:
 - a. General Information and Summary: Inside cover sheet to identify testing, adjusting, and balancing agency; contractor; owner, architect, engineer and project. Include addresses, contact names and telephone numbers. Also, include a certification sheet containing the name, address, telephone number and signature of the Certified Test and Balance Personnel. Include in this division a listing of the instrumentation used for the procedures along with the proof of calibration.
 - b. The remainder of the report shall contain the appropriate forms containing as a minimum, the information indicated on the standard report forms prepared by the AABC for each respective item and system. Prepare a schematic diagram for each item of equipment and system to

accompany each respective report form.

- c. Calibration Reports: Submit proof that all required instrumentation has been calibrated to tolerances specified in the referenced standards, within a period of six months prior to starting the project.

1.09 SUBMITTALS

- A. Submit in accordance with Division 1.
- B. Submit balancing agency qualifications and sample balancing forms.
- C. Provide list of equipment to be used and date of last calibration.
- D. Submit preliminary balance report a minimum of one week prior to substantial completion inspection.

PART 2. PRODUCTS

2.01 INSTRUMENTS

- A. Maintain all instruments accurately calibrated and in good working order. Use instruments with the following minimum performance characteristics.
 1. Pressure Readout: Direct reading in feet of water or PSI, .5% accuracy.
 2. Temperature Instruments - Direct reading in degrees F, +.5% accuracy.
 3. Water Flow Instruments: Differential pressure type; direct reading in feet of water or PSI, accuracy, suitable for readout balancing valve provided.

PART 3. EXECUTION

3.01 GENERAL PROCEDURES FOR ALL SYSTEMS

- A. Start with new, clean filters.
- B. In cooperation with the control manufacturer's representative, coordinate adjustments of automatically operated dampers and valves to operate as specified, indicated and/or noted.
- C. Use manufacturer's ratings on all equipment to make required calculations.
- D. Make final adjustments for each space per heating or cooling comfort requirement. State reason for variance from design CFM, i.e., "too noisy", "drafty", etc.
- E. Mark equipment and balancing device settings (including damper-control positions, valve position indicators, fan-speed-controls, and similar controls and devices) with paint or other suitable permanent identification material to show final settings.

3.02 FLUID SYSTEM TESTING AND BALANCING

- A. Preparation of system - Phase I:

1. Complete air balance before beginning fluid balance.
2. Clean all strainers.
3. Examine fluid in system to determine if treated and clean.
4. Check pump rotation.
5. Verify expansion tanks are not air bound and system full of fluid.
6. Verify all air vents at high points of fluid systems are installed properly and are operating freely. Make certain all air is removed from circuiting system.
7. Open all valves to full flow position including coil and heater stop valves, close bypass valves and open return line balancing cocks. Set temperature controls so that automatic valves are open to full flow through apparatus.
8. Check and set operating temperature of boilers and heat exchangers to design requirements when balancing by temperature drop.
9. Adjust all flows to 110% of design flows as shown.

B. Test and Balance Procedure - Phase II:

1. Set pumps to proper GPM delivery and set proper GPM delivery in main piping runs from boiler room. Note flow variations for additive alternates.
2. Adjust flow of fluid through primary equipment.
3. Check leaving fluid temperatures and return fluid temperatures and pressure drop through major equipment. Reset to correct design temperatures.
4. Check fluid temperature at inlet side of coils and other heat transfer equipment. Note rise or drop of temperatures from source.
5. Balance each coil and all other heat transfer apparatus in system.
6. Upon completion of flow readings and adjustments, mark all settings and record all data.

C. Test and Balance Procedure - Phase III:

1. After making adjustments to coils and apparatus, recheck settings at pumps and major equipment. Readjust if required.
2. Attach pressure gauges on each coil, then read pressure drop through coil at set flow rate on call for full flow through coil. Set pressure drop across bypass valve to match coil full flow pressure drop. This prevents unbalanced flow conditions when coils are on full bypass.
3. Check and record the following items with flows set at 100% of design.
 - a. Inlet and leaving fluid and air temperatures at coils and major equipment.
 - b. GPM flow of each coil and major equipment.
 - c. Pressure drop of each coil and major equipment.
 - d. Pressure drop across bypass valve.
 - e. Pump operating suction and discharge pressures and final total developed head.
 - f. Pump GPM.
 - g. Rated and actual running amperage and voltage of pump motor.
 - h. Full nameplate data of all pumps and equipment.
 - i. Electrical overloads/heaters sizes and ranges of motors.

TESTING, ADJUSTING, AND BALANCING FOR HVAC

Division 23

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4. Permanently mark adjusted position of all balancing valves. Stamp indicator plate of circuit setters and other balancing valves without memory stop.

END OF SECTION

HVAC INSULATION

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Equipment Insulation.
- B. Ductwork Insulation.
- C. Jackets and Accessories.

1.03 RELATED WORK

- A. Division 09 91 00 – Painting.
- B. Section 23 05 00 – Common Work Results for HVAC Systems.
- C. Section 23 31 00 – HVAC Ducts and Casings.

1.04 REFERENCES

- A. ASTM B209 - Aluminum and Aluminum-alloy Sheet and Plate.
- B. ASTM C195 - Mineral Fiber Thermal Insulating Cement.
- C. ASTM C450 - Standard Practice for Fabrication of Thermal Insulating Fitting Covers for NPS Piping, and Vessel Lagging.
- D. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- E. ANSI/ASTM C533 - Calcium Silicate Block and Pipe Thermal Insulation.

- F. ANSI/ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
- G. ANSI/ASTM C547 - Mineral Fiber Pipe Insulation (Preformed).
- H. ANSI/ASTM C552 - Cellular Glass Thermal Insulation.
- I. ANSI/ASTM C553 - Mineral Fiber Blanket Insulation.
- J. ANSI/ASTM C578 - Preformed, Block Type Cellular Polystyrene Thermal Insulation.
- K. ASTM C585 - Standard Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System).
- L. ASTM C612 - Mineral Fiber Block and Board Thermal Insulation.
- M. ASTM C449 - Mineral Fiber Hydraulic-setting Thermal Insulating and Finishing Cement.
- N. ASTM C610 - Expanded Perlite Block and Pipe Thermal Insulation.
- O. ASTM C1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material).
- P. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
- Q. ASTM C1427 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
- R. ASTM D774 – Standard Test Method for Bursting Strength of Paper.
- S. ASTM D1000 - Standard Test Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications.
- T. ASTM E84 - Surface Burning Characteristics of Building Materials.
- U. ASTM E96 – Standard Test Methods for Water Vapor Transmission of Materials.
- V. NFPA 255 - Surface Burning Characteristics of Building Materials.
- W. UL 723 - Surface Burning Characteristics of Building Materials.

1.05 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Include product description, thickness for each service, and locations.
- C. Submit manufacturer's installation instructions.

1.06 QUALITY ASSURANCE

- A. Applicator: Company specializing in piping insulation application with three years minimum experience.

- B. Pipe insulation manufactured in accordance with ASTM C585 for inner and outer diameters.
- C. Materials: Flame spread/smoke developed rating of 25/50 in accordance with UL 723, ASTM E84, or NFPA 255.
- D. Factory fabricated fitting covers manufactured in accordance with ASTM C450.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Division 1 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- C. Shipment of materials from manufacturer to installation location shall be in weather tight transportation.
- D. Protect from weather and construction traffic, dirt, water, chemical, and damage, by storing in original packaging.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesive, mastics, and insulation cements.

1.09 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.10 WARRANTY

- A. Division 1- Execution and Closeout Requirements: Product warranties and product bonds.

PART 2. PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Armacell.
- B. Certain-Teed.
- C. IMCOA.
- D. Johns Manville.
- E. Knauf.
- F. Owens-Corning.
- G. Manson.

- H. Nomaco.
- I. Pittsburgh - Corning.
- J. K-Flex USA.
- K. Armstrong.
- L. Substitutions: Under provisions of Division 1.

2.02 INSULATION - DUCTWORK

- A. Type K: Exterior FSK Duct Wrap: Flexible glass fiber; ASTM C553; commercial grade; 'k' value of 0.27 at 75° F, 0.6 lb./cu. ft. density. 0.00035 inch vinyl scrim facing with 2" stapling tab. Johns Manville "Microlite Standard Duct Wrap" or equal.
- B. Type L: Exterior FSK Rigid Fiber Board Duct Insulation; ASTM C612, 'k' value of 0.23 at 75° F, 3.0 lb./cu. ft. density. 0.00035 inch foil scrim facing. Johns Manville "814 Spin-Glas" or equal.
- C. Type P: Field Applied Grease Duct Enclosure - UL 1479 Listed for 0-clearance to combustibles. Smoke/Flame Index of 0/0. Tested in accordance with ASTM E2336. 1-1/2" Thickness, 6 PCF Density. 3M Fire Barrier Ductwrap or approved equal.

2.03 FIELD APPLIED EQUIPMENT AND DUCTWORK JACKETS

- A. Aluminum Jackets: ASTM B209; 0.016 inch thick; corrugated or textured finish, longitudinal slip joints.
- B. Stainless Steel Jackets: Type 304 stainless steel; 0.010 inch thick; corrugated finish.
- C. Re-Wettable Canvas Jacketing: Fiberglass cloth made from texturized yarns, impregnated throughout with an inorganic fire retardant asbestos free adhesive; 20x14 thread count, 14.5 oz./sq.yd, 0.04 inch thickness, 1,000° F upper temperature limit; GLT Products "Style 1989" or approved equal.

2.04 INSULATION ACCESSORIES

- A. Adhesives: Waterproof and fire-retardant type.
- B. Lagging Adhesive: Fire resistive to NFPA 255.
- C. Impale Anchors: Galvanized steel, 12-gauge, self-adhesive pad.
- D. Joint Tape: Glass fiber cloth, open mesh.
- E. FSK Joint Tape; ASTM C1136 Foil-Scrim-Kraft (FSK) lamination coated with solvent acrylic pressure sensitive adhesive; capable of adhering to fibrous and sheet metal surfaces; tri-directionally reinforced 2x3 squares per inch fiberglass scrim; 9.5 mils thick, -40 to 240° F service temperatures; Venture Tape "1525CW" or approved equal.
- F. Tie Wire: Annealed steel, 16 gauge.

- G. Insulated pipe supports: Calcium silicate with galvanized steel jacket (min. 24 gauge); ANSI/ASTM C533; rigid white; 'k' value of 0.37 at 100° F, rated to 1,200° F; Thermal Pipe Shields "T-1000 Calsil" or equal.

PART 3. EXECUTION

3.01 PREPARATION

- A. Install materials after piping, equipment and ductwork has been tested and approved.
- B. Clean surfaces for adhesives.
- C. Prepare surfaces in accordance with manufacturer's recommendations.

3.02 INSTALLATION – DUCTWORK INSULATION

- A. Install materials in accordance with manufacturer's instructions.
- B. Provide insulation with vapor barrier when air conveyed may be below ambient temperature. Continue insulation with vapor barrier through penetration.
- C. Exterior Insulation (Type J) Application:
 - 1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.
 - 2. Secure insulation without vapor barrier with staples, tape, or wires.
 - 3. Install without sag on underside of ductwork. Use mechanical fasteners to prevent sagging. Secure insulation with mechanical fasteners on 15-inch centers maximum, on bottom and side of ductwork with dimension exceeding 20 inches. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.
 - 4. Maximum 25% compression.
- D. Fiberglass Duct Liner (Type L) Application:
 - 1. Adhere insulation with approved adhesive for 100 percent coverage. Secure insulation with mechanical fasteners on 15-inch centers maximum on top and side of ductwork with dimension exceeding 20 inches. Butt joints together tightly then seal and smooth. Thoroughly coat ends of liner with adhesive. Do not use nail-type fasteners. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.
 - 2. Ductwork dimensions indicated are net inside dimensions required for air flow. Increase ductwork to allow for insulation thickness.
 - 3. Install liner as indicated on plans.
- E. Field Applied Grease Duct Enclosure (Type P): Install duct fire wrap in accordance with manufacturer installation instructions. Lap all seams and provide banding as necessary to achieve a UL listed assembly.
- F. Where canvas jacketing is indicated, apply mastic in sufficient thickness to completely cover the texture of the canvas material.

3.03 SCHEDULE - DUCTWORK

DUCTWORK	TYPE	INSULATION THICKNESS	FINISH
Exhaust & Relief Ducts Within 10 ft. of Exterior Openings	J,K	1" [Rigid]	FSK
Ventilation Equipment Casings	K	2"	--
Field Applied Grease Duct Enclosure	P	Per Listing	Per Listing

END OF SECTION

DIRECT DIGITAL CONTROL SYSTEM FOR HVAC

PART 1. GENERAL

1.01 NOTIFICATIONS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead are also present in the settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Division 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with the EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SUMMARY

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Standard General Provisions Specification Sections, apply to this Section.
- B. All building controllers, application controllers, and all input/output devices shall communicate using the protocols and network standards as defined by ANSI/ASHRAE Standard 135-2001, BACnet.
- C. Provide all necessary BACnet-compliant hardware and software to meet the system's functional specifications. Provide Protocol Implementation Conformance Statement (PICS) for Windows-based control software and every controller in system, including unitary controllers.
- D. Prepare individual hardware layouts, interconnection drawings, and software configuration from project design data.
- E. Implement the detailed design for all analog and binary objects, system databases, graphic displays, logs, and management reports based on control descriptions, logic drawings, configuration data, and bid documents.
- F. Design, provide, and install all equipment cabinets, panels, data communication network cables needed, and all associated hardware.
- G. Provide and install all interconnecting cables between supplied cabinets, application controllers, and input/output devices.

- H. Provide and install all interconnecting cables between all operator's terminals and peripheral devices (such as printers, etc.) supplied under this section.
- I. Provide complete manufacturer's specifications for all items that are supplied. Include vendor name of every item supplied.
- J. Provide supervisory specialists and technicians at the job site to assist in system startup, and commissioning.
- K. Provide a comprehensive operator and technician training program as described herein.
- L. Provide as-built documentation, operator's terminal software, diagrams, and all other associated project operational documentation (such as technical manuals) on approved media, the sum total of which accurately represents the final system.
- M. Provide new sensors, dampers, valves, and install only new electronic actuators. No used components shall be used as any part or piece of installed system.

1.03 SYSTEM DESCRIPTION

- A. Distributed logic control systems complete with all software and hardware functions shall be provided and installed. System shall be completely based on ANSI/ASHRAE Standard 135-2001, BACnet. This system is to control all mechanical equipment, including all unitary equipment such as pumps, air handlers, heat exchangers, etc. and any other listed equipment using native BACnet-compliant components.
- B. Provide all alarms, manual control, and status indication functions as indicated under the sequence of operation, Specification Section 23 09 93.

1.04 RELATED SECTIONS

- A. Section 23 05 00 – Common Work Results For HVAC.
- B. Division 26 – Electrical Specifications

1.05 REFERENCES

- A. ANSI/ASHRAE 135-2012 Data Communication Protocol for Building Automation and Control Networks (BACnet).

1.06 QUALITY ASSURANCE

- A. The direct digital control system provided shall be designed, furnished, installed, tested, certified and placed into service by a Control Contractor who is regularly engaged in the installation of direct digital control systems in Alaska. The Control Contractor shall maintain an office in Alaska with parts and maintenance personnel to ensure prompt response (24 hour maximum) to an emergency call during the one year correction period.
- B. The Control Contractor shall be able to demonstrate that he has had experience designing and installing direct digital control systems of comparable type and size to that called for in these Specifications.
- C. The Control Contractor, if other than the manufacturer, shall hold a manufacturer's franchise or license to design and install control systems for that manufacturer.

- D. Within two weeks after award of contract submit to the Project Manager the following items for Contractor qualification:
1. Name of manufacturer and proof that the Control Contractor holds a manufacturer's franchise or license to design and install the proposed control system.
 2. Proof of Alaskan Office, with full time service representative.
 3. List of Alaskan buildings with names, addresses, and phone numbers of Owners which are representative of direct digital control systems that have been installed by the Control Contractor. Include a brief description and approximate control system construction cost of each system submitted.
 4. Provide verification that each and every controller, sensor, and all other BAS components shall be individually tested and listed by the BACnet Testing Laboratories (BTL).

1.07 EQUIPMENT AND SHOP DRAWING REVIEW SUBMITTALS

- A. Provide electronic submittals in accordance with Section 23 05 00 and Division 1.
- B. Prior to programming, ordering of equipment, or installation of any portion of the system submit the following in a single tabbed and indexed PDF package for review by the Project Manager. The shop drawings shall include an electronic bookmark for every major system initial sheet. Shop drawings without bookmarks will be rejected without review for correction.
1. System architecture diagram showing power supply to each component; interconnection of direct digital controllers, building management station, and peripherals; and indication of proposed location of direct digital controllers.
 2. Sequence of operations. Print sequence of operations on the schematic control diagrams so that the relevant sequence is on the same diagram with the control schematic it describes. The Sequence of Operations provided in the Contract Documents is written in directive language. Rewrite the sequence of operations to be submitted to the Owner in language that explains the sequences of operation. Remove all directives to the Contractor.
 3. Schematic control diagrams 11 inches by 17 inches minimum paper size with upper case lettering, minimum 1/16 inch high plotted from digitized files in AutoCAD format. Clearly indicate wire and terminal labels, set points, reset schedules, switch over points, signal ranges, and other points required to completely describe the system. Show interface with any existing control systems. Depict circuitry on schematic control diagrams to allow circuits to be traced from connection to connection using one of the following methods:
- C. Diagram each wire or tube depicting full length of circuit from connection to connection.
- D. Reference each wire to a uniquely labeled terminal. Depict terminals on a sequentially labeled terminal strip showing attached wires and the device labels of the components attached at the other end. If the wiring label used is different than the terminal label indicate the wire label. In addition, provide ladder diagrams indicating current or air flow through circuitry components.
- E. Construct digitized schematic control diagrams using a symbol library so that symbols for similar equipment are common. Use separate layers or line type designations for the following items:
1. Device Symbols.

2. Equipment Symbols.
 3. Ductwork.
 4. Piping.
 5. Wiring.
 - a. Control Wiring Floor Plans. Provide architectural floor plans overlaid with control components. Plans shall include locations of sensors, valves, dampers, transformers, control cabinets, mechanical and electrical equipment interlocked or controlled by BAS, and communication and power wiring.
 - b. Subpanel and panel face layouts.
 - c. Control components data sheets, installation, operation, and adjustment instructions. Further index and tab this section of the submittal by item number.
- F. Each control component shall be identified with a separate item number. Separate each item with a divider sheet with plastic index tabs.
- G. Provide two alphabetical listings of all items included in the binder in an index at the front of the binder. One index shall list items by functional name. The other index shall list items by symbol used in the control diagrams.
- H. Each sheet or page shall indicate the specific item(s) proposed for this project. Delete or cross out all other items.
- I. For all system elements operator's workstation(s), building controller(s), application controllers, routers, and repeaters, provide BACnet Protocol Implementation Conformance Statements (PICS) as per ANSI/ASHRAE Standard 135-2001.
- J. Provide complete description and documentation of any proprietary (non-BACnet) services and/or objects used in the system.
 1. Orientation and training instruction schedule and course outlines.
 2. Control Transformer Schedule. Provide control transformer schedule indicating tag id, location, equipment serviced, and VA consumed. Transformers shall be UL listed, class 2 power limited, provide built in circuit breaker and have a minimum of 15% spare capacity.

1.08 OPERATION AND MAINTENANCE MANUALS

- A. Provide electronic operations and maintenance manuals in accordance with Section 23 05 00 and Division 1 Standard General Provisions.
- B. Operation and Maintenance Manuals must be submitted for review, reviewed by the Project Manager, corrected in accordance with review comments, and accepted by the Project Manager before a request for final or substantial completion inspection will be considered by the Project Manager.
- C. The Operation and Maintenance Manual shall include the information required for the equipment review submittal, updated as required to reflect current as-built conditions, plus the following:
 1. A brief customized guide to system operation prepared for the proprietary programming and interfacing software. Include copies of the guide in the Operation

and Maintenance Manual, laminated between two plastic sheets for use away from the workstations. The guide shall include:

- D. Log on procedure.
- E. Procedure for accessing interactive video display screens, changing set points, acknowledging alarms, creating history logs, and reviewing history logs.
- F. Instructions for backing up the building management system and start up the system after a computer failure.
- G. Instructions for backing up individual direct digital controllers and start them up after a controller failure.
 - 1. Maintenance information and parts lists for control components.
 - 2. Complete system as-built wiring diagrams indicating the following:
- H. Wiring for all control and power circuits indicating the voltage and breaker location for each circuit.
- I. Wiring for direct digital controllers and interface panels.
- J. Terminal number or code name for terminals in direct digital controllers and interface panels with unused terminals marked "spare".
- K. Assigned name, address, and engineering units for direct digital controller input and output terminals.
 - 1. Control Wiring Floor Plans. Provide architectural floor plans overlaid with control components. Plans shall include locations of sensors, valves, dampers, transformers, control cabinets, mechanical and electrical equipment interlocked or controlled by BAS, and communication and power wiring.
 - 2. Control Transformer Schedule. Provide control transformer schedule indicating tag id, location, equipment serviced, and VA consumed.
 - 3. Valve Schedule.
 - 4. List of software with current revision numbers, vendor name and support telephone numbers.
 - 5. Include copies of programming and variable printouts for the direct digital control logic created to fulfill the sequence of operation requirements. Include the following information:
- L. Print the sequence of operation corresponding to the program listing on that page.
- M. Block Programming diagrams if block programming is used.
 - 1. Provide backup copy of programming and graphics for the direct digital control system with instructions on how to install the backup software if the system needs to be re-installed. Provide on USB drive.
 - 2. Provide digitized copies of O & Ms, as built schematic control diagrams, wiring diagrams, and graphic screens recorded on USB drive in PDF drawing format.
 - 3. Provide a print out of the configuration files for each controller. Place controller specific print out in specific controller cabinet.
 - 4. Provide other information required for the Owner to properly troubleshoot and maintain the control system.

- N. Published and bound building management system software or hardware manuals are not required to be included in the three ring "Operation and Maintenance Manual". Provide one digital copy of each published building management system software or hardware manual required for the maintenance and operation of building management system to the Project Manager one week prior to request for substantial completion. Provide a separate index sheet describing each separate manual as part of the "Operation and Maintenance Manual".
- O. Provide editing facilities used in the developing of the building management system so that any custom programming required to apply the building management system to this project is accessible to a trained operator for viewing, editing, or creating similar software structures. List software that cannot be changed by the operator with model and version number. Any custom software is considered the property of the owner with full right to copy. This software is required to work across the BACNET/IP network.
- P. After the final inspection and subsequent punch list inspections update each copy of the Operation and Maintenance Manual to reflect final as-built conditions.

1.09 SYSTEMS DEMONSTRATION

- A. The Contractor will completely check out, calibrate and test all connected hardware and software to ensure that the system performs in accordance with the approved specifications and sequences of operation.
- B. Provide complete demonstration of system operation to the owners representative at the project substantial completion inspection. The Contractor will demonstrate to the Owner's satisfaction that all equipment and systems operate in accordance with the sequence of operation as outlined under Section 23 09 93. Demonstration will include all equipment controlled by the Direct Digital Control System.
- C. Building management station demonstration will consist of:
 - 1. Running sample point log and system configuration reports as requested.
 - 2. Display and demonstrate each data entry to show site specific customizing capability. Demonstrate parameter changes.
 - 3. Step through penetration tree, display all graphics, demonstrate dynamic update and direct access to graphics.
 - 4. Execute system commands in graphic mode including operation of control system set points, schedules, valves, dampers and control relays. Commands shall be executed as necessary to demonstrate the system is controlling in accordance with the sequence of operations.
 - 5. Demonstrate update, and alarm responsiveness.
 - 6. Demonstrate digital system configuration graphics with interactive upload and download and demonstrate specified diagnostics.

1.10 WARRANTY

- A. Under provisions of Division 1 Standard General Provisions.
- B. All components, system software, parts and assemblies will be guaranteed against defects in materials and workmanship for one year from acceptance date.
- C. Labor to troubleshoot, repair, reprogram, or replace system components will be furnished by the Contractor at no charge to the owner during the warranty period.

- D. All corrective software modifications made during warranty service periods will be updated on user documentation and on user and manufacturer archived software.

1.11 SUBSTANTIAL INSPECTION SUPPLEMENTAL DATA

- A. Substantial inspection supplemental data must be submitted for review, reviewed by the Project Manager, corrected in accordance with review comments, and accepted by the Project Manager before a request for substantial completion inspection will be considered by the Project Manager.

PART 2 - PRODUCTS

2.01 APPROVED BUILDING AUTOMATION SYSTEMS

- A. Siemens Building Technologies Inc.

2.02 SENSORS

- A. Current Sensor:
 - 1. Current transformer and conditioning circuitry to convert AC line current to binary output, Veris Hawkeye or equal.

2.03 SWITCHES

- A. Current Operated Switches:
 - 1. Provide current sensing relays for status of fans or pumps as called out in sequence of operation. Provide with field adjustable current setpoint range suitable for application. Adjust sensor for equipment current draw. Veris or equal.
 - 2. Internal circuits powered by induced line current.

2.04 CONTROL RELAYS

- A. General: Provide relays rated for current and voltage requirements of controlled equipment.
- B. Panel Mounted Relays:
 - 1. Plug in type, with DIN rail mountable plug in sockets. IDEC RH series or equal.
 - 2. UL listed.
- C. Field Mounted Relays:
 - 1. Solid state packaged relay including relay, LED indicator, provisions for mounting, transient protection and housing. Functional Devices RIB T series or equal.
 - 2. Provide with a Hand-Off-Auto switch.
 - 3. Provide internal separation between class 1 and class 2 wiring including separate wire ways or nipples.
 - 4. UL listed.

2.05 WIRING AND RACEWAYS

- A. Provide wiring and raceway complying with the National Electrical Code, Division 26, and State and Local Codes and Ordinances.
- B. Provide wiring and raceway complying with the National Electrical Code, and State and Local Codes and Ordinances.
- C. Raceways:
 - 1. EMT, metal duct, IMC, surface metal raceways, or totally enclosed metal trough with flexible metal tubing unless otherwise noted.
 - 2. Provide rigid steel conduit raceways when raceway is buried or embedded in concrete.
 - 3. Provide 18 inches minimum to 36 inches maximum flexible metal conduit of galvanized steel construction for final connection to control devices. For connections to pipe mounted devices, and to devices in damp, wet, or exterior locations, or in mechanical rooms containing boilers or steam converters, provide oil-resistant liquid-tight flexible metal conduit.
 - 4. Provide EMT connectors with rain tight compression fittings and insulated throats.
 - 5. Wire mould is generally not allowed except as approved on a case-by-case basis with the owner's representative.
- D. Wiring:
 - 1. Provide wire with copper stranded conductors. Provide color or number coded jackets.
 - 2. Low voltage wiring from control components to input/output modules: 20-gauge minimum foil-shielded cable rated 100 VDC at 80 deg C.
 - 3. Provide plenum rated cable whenever wire is run without conduit.
 - 4. Provide communications network wiring meeting the gauge, impedance, capacitance, resistance and shielding requirements specified by the manufacturer of the connected devices.
 - 5. Identify wires and cables with permanent self-laminating machine print labeling system. Provide labels capable of receiving 8 characters of type written text, with minimum print on area of 1 inch by 1/2 inch and protected by a clear sheath. Thomas & Betts E-Z Code or equal.
 - 6. Support or bundle wire with self locking, UL listed cable ties. Provide 40 lb rated cable ties incorporating a stainless-steel locking insert. Provide UL 94V-0 flammability rated, halar cable ties when installed without panel enclosure. Thomas & Betts Ty-Rap or equal.
 - 7. Provide cable tie anchors designed for mechanical anchoring, allowing removal of cable tie without removal of anchor, capable of accepting at a minimum a number 8 screw. Adhesive cable tie anchors are allowed only on the interior surface of panel doors. Panduit TM series or equal.

PART 3. EXECUTION

3.01 GENERAL

- A. Modify existing control system devices as indicated. Extend and modify the existing wiring and control system power source to accommodate indicated direct digital control system devices.

- B. Before beginning installation of new system components, test the existing system devices that are being reused in modified control systems for proper operation and report any devices in need of replacement or repair to the Project Manager. At the option of the Project Manager, he will issue a contract amendment to replace or repair the defective devices or he will have Owner maintenance personnel replace or repair the defective devices. The Contractor shall be responsible for providing new devices to replace existing devices that are not brought to the Project Manager's attention before beginning installation of new system components.
- C. Work must comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards. Perform work by persons qualified to produce workmanship of specified quality. If required by the State of Alaska workers shall be licensed. If requested provide copy of license.
- D. Do not install control devices in locations where they are subject to damage or malfunction due to normally encountered ambient temperatures.
- E. Schematics and diagrams, when indicated on the Drawings, show approximate functional relationships and sequences only. All required devices are not shown. Contractor is responsible for providing all components required for a complete functioning system selected to meet the specific functional requirements of each application.
- F. Hard wire control devices. Do not use power line carriers.
- G. Ensure that the direct digital controller network, and power wiring will support both a 15 percent increase in network length, and a 10 percent increase in controllers similar to those installed without having to add additional network repeaters, increase power wire size or circuit breaker capacity.
- H. Unless indicated otherwise, connect the primary sensing input and the associated output for each control loop to the same controller. A secondary or resetting input may be attached to any controller and communicated over the network.
- I. After the final inspection and subsequent punch list inspections provide wiring schematic and Control Drawings with written sequence of operations, 11 inches by 17 inches in size, produced from the as-built Control Drawings. Provide one copy in each Operation and Maintenance Manual, and one copy, at its applicable control panel. Provide one set of system backup on USB drive to restart and reload all programmable devices used in the control system.
- J. Label control devices mounted in the field and within control cabinets with 1/4-inch-high white embossed letters and black tape background. Dymo or equal. Tags to match tags used on Control Drawings.

3.02 DEMOLITION

- A. Existing conduit and wiring may be reused when available and when wiring is rated for application. Remove existing unused conductors.
- B. Repairs: Any portion of the facility damaged, cut back or made inoperable shall be repaired with similar materials as the existing structure and/or damaged item as instructed by the Project Manager.

3.03 WIRING AND RACEWAYS

- A. Permanently label electrical or electronic wiring at each end indicating location and the device at opposite end. At the direct digital controller end use either the I/O address, if it describes the connected device, or the unique control device tag used on the control schematics. At the device end indicate both the terminal number and the controller connected at the other end. For color coded multi-conductor cable, label cable sheath not individual conductors.
- B. At field devices where conductors are not wired to terminal strips wire using a unique color for each conductor connected to that device.
- C. Install wiring in a neat and orderly manner generally running along building lines.
- D. Support low voltage wiring run without conduit at a maximum of 4 feet between anchors.
- E. Seal conduit penetrations at floor and wall penetrations with firestopping installed as indicated. Note that this applies to all floor and wall penetrations, not just fire barrier penetrations. At all mechanical rooms or other rooms containing floor drains, except those with slab on grade floors, make penetration watertight and extend sleeve 3 inches above the floor.
- F. Wire all electrical controls and switches furnished under this Section of the Specifications.
- G. Make wire connections using factory fabricated jack assemblies, terminal strips, or solder connections. Use crimp connectors on stranded wire unless connecting to terminal strips approved for direct stranded wire connection. Insulate solder connections with heat shrink tubing. Field connections in control power wiring circuits may be made using wire nuts.
- H. Avoid splices in signal wire, where unavoidable connect with solder connections and label on each side of splice. Use identical wire type and color on each side of splice.
- I. Conceal wiring in finished areas. Unless otherwise noted, install wiring inside conduit or fully enclosed metallic raceway.
- J. Low voltage wiring installed in concealed accessible locations may be run without conduit. Sleeve wiring at wall penetrations.
- K. Metal raceways crossing expansion joints make provision for 3-way movement. For conduits 1 & 1/2 inch and larger use O-Z type DX fittings, or equal.
- L. At raceway penetrations of the vapor barrier provide a double splice patch (one on each side of vapor barrier) by cutting a square piece of vapor barrier 12 inches larger on all sides than the pipe. Cut a round hole in the center of the square splice patch, smaller than the pipe, to form a stretched fit. Force the pipe through the splice patch and tape all sides to the vapor barrier and seal the vapor barrier to the pipe at the penetration with an adhesive compatible with the vapor barrier material.
- M. Securely seal at both ends, raceways running from a warm area to a cold area. Ductseal or equal.
- N. Install all wiring in accordance with National Electrical Code, and State and Local Codes and Ordinances.

3.04 TESTING AND ADJUSTING

- A. Upon completion of the installation, the contractor shall initiate operation of the control system and perform all necessary testing and diagnostics to ensure proper operation. A formal commissioning procedure shall be utilized to ensure complete system integrity and conformance to these specifications. This procedure shall consist of two separate steps incorporating point verification and program verification. Commissioning forms shall address all field devices, field controllers, software statements, and software points. Submit for approval a written testing procedure indicating how each of these steps will be accomplished at least two weeks prior to the start of the commissioning process.
- B. Verify correct installation and wiring of all points.
- C. Prior to commissioning the system, submit for approval Point Verification Commissioning Forms listing all points for the system.
- D. Confirm that all devices are installed correctly. Verify that terminations are tight and of correct polarity. Document and signoff the results on Point Verification form.
- E. Coordinate the final adjustments and "fine tuning" of control functions and devices so that the building, the mechanical systems, and the control systems operate and respond as an integrated, comfortable and energy efficient component of this facility.
- F. Verify that all points are wired to the correct termination block at the control panel by verifying continuity between the device and the panel termination. Document and signoff results on Point Verification form. Verify that each sequence performs as specified in contract documents. Tune each loop as required for proper operation.
- G. Document and signoff the results on Program Verification form.
- H. Command all digital output points on and off and confirm proper operation of the associated output device. Command all analog output points to various levels within their range and confirm proper operation of the associated output device. Activate all digital input sensors and confirm proper point status at the panel. Measure conditions at all analog input sensors with an independent reference device, calibrate as required, and confirm proper point status at the panel. Document and signoff the results on Point Verification form.
- I. Deficiencies revealed by failed test(s) shall be repaired and corrected and the test(s) repeated until successful.
- J. Provide Substantial inspection data to consist of the following as a minimum:
 - 1. Provide signed off Point Verification commissioning forms to mechanical engineer and owner prior to owner acceptance walkthrough.
 - 2. Provide signed off Point Verification forms indicated the correct execution of all sequence of operations for each piece of equipment. List test procedure and results.
 - 3. Point logs indicated point values with time and date stamp.

3.05 SUBSTANTIAL INSPECTION REQUIREMENTS

- A. Substantial inspection data must be submitted for review, reviewed by the Project Manager, corrected in accordance with review comments, and accepted by the Project Manager before a request for final or substantial completion inspection will be considered by the Project Manager.

DIRECT DIGITAL CONTROL SYSTEM FOR HVAC

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- B. Prior to the substantial inspection, review and test entire installation for conformance with contract documents. Test shall include thorough field check of sequence of operations for each system and piece of equipment including simulation of all possible modes of operation. With the call for inspection, verify in writing that this system review and test has been performed and anything not conforming to contract documents shall be so noted.
- C. During the Substantial inspection Contractor personnel shall provide on-site assistance to inspection personnel required for a complete and thorough inspection.
- D. During the Substantial inspection Contractor personnel shall demonstrate that the control system performs in accordance with the contract documents. Provide material and personnel required to perform the demonstration.

END OF SECTION

SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

PART 1. GENERAL

1.01 NOTIFICATIONS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead are also present in the settled and concealed dust in and on architectural, structural, mechanical, and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Division 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with the EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Finned Tube Radiation.
- B. Heat Trace.

1.03 RELATED SECTIONS

- A. Section 23 05 00 - Common Work Results for HVAC.

1.04 SYSTEM DESCRIPTION

- A. This Section defines the manner and method by which controls function. Requirements for each type of control system operation are specified. Equipment, devices, and system components required for control systems are specified in other Sections.

1.05 SUBMITTALS

- A. Submit under provisions of Division 1.
- B. Submit diagrams indicating mechanical system controlled and control system components. Label with settings, adjustable range of control and limits. Include written description of control sequence.
- C. Include flow diagrams for each control system, graphically depicting control logic.
- D. Include draft copies of graphic displays indicating mechanical system components, control system components, and controlled function status and value.

1.06 PROJECT RECORD DOCUMENTS

- A. Submit documents under provisions of Division 1.
- B. Accurately record actual setpoints and settings of controls, including changes to sequences made after submission of shop drawings.

PART 2. PRODUCTS - Not Used

PART 3. EXECUTION

3.01 FINNED TUBE RADIATION

- A. Alarms:
 - 1. High Space Temperature.
 - 2. Low Space Temperature.
- B. Digital Control and Indication:
 - 1. Space temperature setpoint.
 - 2. Space temperature indication.
 - 3. Supply temperature indication.
 - 4. Operation mode schedule adjustment.
 - 5. Operation mode indication.
 - 6. Heating coil control valve position.
 - 7. Alarm Setpoints.
- C. Automated Control:
 - 1. Operation Mode: Occupancy mode shall be set to 7am to 6pm M-F. All other times and holidays shall be unoccupied mode. Provide a user adjustable holiday schedule.
 - 2. Unoccupied Mode: Terminal control valve will cycle to maintain unoccupied mode setpoint.
 - 3. Occupied Mode: Terminal control valve will cycle to maintain occupied mode setpoint.

3.02 HEAT TRACE

- A. Alarms:
 - 1. No current HT-ST1.
- B. Digital Control and Indication:
 - 1. On-Off Control HT-ST1
- C. Automated Control:
 - 1. Heat trace shall be off from May 1st through September 31st.
 - 2. During the months of October, April, and May the outside air temperature shall be monitored and if the temperature has remained above 35 deg F for 72 hours

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- including the current day, the heat trace shall be turned off. If the temperature falls below 32 deg F at any time the heat trace shall be turned on.
3. Heat trace shall be turned on from November 1st through March 31st.

END OF SECTION

HYDRONIC PIPING

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 WORK INCLUDED

- A. Pipe and Pipe Fittings.
- B. Valves.
- C. Heating Water Piping System.

1.03 RELATED WORK

- A. Section 23 05 00 - Common Work Results for HVAC.
- B. Section 23 07 00 - HVAC Insulation.
- C. Section 23 09 23 - Direct Digital Control System for HVAC.
- D. Section 23 21 16 - Hydronic Piping Specialties.
- E. Section 23 82 00 - Convection Heating and Cooling Units.

1.04 REGULATORY REQUIREMENTS

- A. Conform to ANSI/ASME B31.9.

1.05 QUALITY ASSURANCE

- A. Valves: Manufacturer's name and pressure rating marked on valve body.

1.06 SUBMITTALS

- A. Submit product data under provisions of Division 1.

1.07 WARRANTY

- A. Polypropylene pipe and fittings shall be covered by a factory warranty for 30 years to be free of defects in materials or manufacturing.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site under provisions of Division 1.
- B. Store and protect products under provisions of Division 1.
- C. Deliver and store valves in shipping containers with labeling in place.

PART 2. PRODUCTS

2.01 HEATING WATER AND GLYCOL PIPING, ABOVE GROUND

- A. Copper Tubing: ASTM B88, Type L, hard drawn.
 - 1. Fittings: ANSI/ASME B16.18 Cast Copper Alloy Solder Joint Pressure Fittings or ANSI/ASME B16.22 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
 - 2. Joints: ASTM B32, solder, Grade 95TA or ANSI/AWS A5.8, BCuP silver braze; Flux: ASTM B813.
 - 3. Press Fittings: Nibco and Viega ProPress Fittings are allowed. Sealing elements for press fittings shall be EPDM. Sealing elements shall be factory installed or an alternative supplied by fitting manufacturer. Press end shall have Smart Connect feature design leakage path. Smart Connect™ (SC Feature) In ProPress ½" to 4" dimensions the Smart Connect Feature assures leakage of liquids and/or gases from inside the system past the sealing element of an un-pressed connection. The function of this feature is to provide the installer quick and easy identification of connections which have not been pressed prior to putting the system into operation.

2.02 FLANGES, UNIONS, AND COUPLINGS

- A. Pipe Size 2 Inches and Under: 150 psig malleable iron unions for threaded ferrous piping; bronze unions for copper pipe, soldered joints.
- B. Pipe Size Over 2 Inches: 150 psig forged steel slip-on flanges for ferrous piping; bronze flanges for copper piping.

2.03 GATE VALVES

- A. Gate valves will not be permitted. Use ball or valves for isolation.

2.04 GLOBE VALVES

- A. Globe valves will not be permitted. Use ball valves for throttling.

2.05 ACCEPTABLE MANUFACTURERS - ALL VALVE TYPES

- A. Apollo.
- B. Crane.
- C. FNW.
- D. Hammond.
- E. Milwaukee.
- F. NIBCO.
- G. Red-White Valve Corp.
- H. Substitutions: Under provisions of Division 1.

2.06 BALL VALVES

- A. Up to 2 Inches: 600 PSI CWP Bronze two-piece body, full port, forged brass, chrome plated ball, Teflon seats and stuffing box ring, lever handle, solder or threaded ends with union. Seat material to be compatible with fluid handled.
- B. Over 2 Inches: Cast steel, two-piece body, full port chrome plated steel ball, Teflon seat and stuffing box seals, lever handle flanged. Seat material to be compatible with liquid handled.

2.07 SWING CHECK VALVES

- A. Up to 2 Inches: Bronze 45° swing disc, solder ends.
- B. Over 2 Inches: Iron body, bronze trim, 45° swing disc, renewable disc and seat, flanged ends.

2.08 SPRING LOADED CHECK VALVES

- A. Iron body, bronze trim, stainless steel spring, renewable composition disc, screwed, wafer or flanged ends.

2.09 RELIEF VALVES

- A. Bronze body, Teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labeled.

PART 3. EXECUTION

3.01 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

- D. After completion, fill, clean, and treat systems.

3.02 INSTALLATION

- A. Route piping in orderly manner, plumb and parallel to building structure, and maintain gradient.
- B. Install piping to conserve building space, and not interfere with use of space and other work.
- C. Group piping whenever practical at common elevations.
- D. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 23 05 16.
- E. Provide clearance for installation of insulation, and access to valves and fittings.
- F. Provide access where valves and fittings are not exposed.
- G. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- H. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- I. Prepare pipe, fittings, supports, and accessories for finish painting. Refer to Division 09.
- J. Install valves with stems upright or horizontal, not inverted.
- K. Support all piping in accordance with International Mechanical Code and Manufacturer installation instructions. Where there is a conflict between requirements of the Mechanical Code and Manufacturer installation instructions, the more restrictive requirement shall apply.

3.03 APPLICATION

- A. Install unions downstream of valves and at equipment or apparatus connections.
- B. Install brass male adapters each side of valves in copper piped system. Sweat solder adapters to pipe.
- C. Install ball or butterfly valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- D. Install ball or butterfly valves for throttling, bypass, or manual flow control services.
- E. Provide spring loaded check valves on discharge of condenser water pumps.
- F. Provide $\frac{3}{4}$ inch ball drain valves at main shut-off valves, low points of piping, bases of vertical risers, and at equipment. Pipe to nearest drain.

3.04 CLEANING OF THE HYDRONIC SYSTEM

- A. Prior to starting work, verify system is complete. Thoroughly flush and drain the new piping. Clean all strainers. Re-install strainer baskets and refill system.
- B. Fill system with water or glycol as indicated on the plans. Feed water to system through make-up line with pressure regulator, venting system high points. Set to fill to match existing system pressure.
- C. Submit a written and signed statement to the Owner that the above referenced cleaning procedures have been completed.

3.05 TESTING

- A. Test all new heating water and glycol piping hydrostatically at 100 psig or 150 percent of working pressure, whichever is greater, for a period of 4 hours. Observe piping during this period and repair all leaks.

END OF SECTION

HYDRONIC SPECIALTIES

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 WORK INCLUDED

- A. Air Vents.
- B. Strainers.
- C. Flow Indicators, Controls, Meters.
- D. Flow Control Valves.

1.03 RELATED WORK

- A. Section 23 05 00 - Common Work Results for HVAC.
- B. Section 23 09 23 - Direct Digital Control System for HVAC.

1.04 REFERENCES

- A. ANSI/ASME - Boilers and Pressure Vessels Code.

1.05 QUALITY ASSURANCE

- A. Manufacturer: For each product specified, provide components by same manufacturer throughout.

1.06 SUBMITTALS

- A. Submit product data under provisions of Division 1 and Section 23 05 00.

- B. Submit glycol solution test results with glycol percentage and PH after system fill procedures are completed.

1.07 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Division 1.
- B. Include installation instruction, assembly views, lubrication instructions, and replacement parts list.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site under provisions of Division 1.
- B. Store and protect products under provisions of Division 1.

PART 2. PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - AIR VENTS

- A. Taco.
- B. Amtrol.
- C. Bell & Gossett.
- D. Substitutions: Under provisions of Division 1.

2.02 AIR VENTS

- A. Manual Type: Disk type vent with built-in check valve for manual or automatic operation, discs replaceable without draining system, 1/8-inch shank, rated at 50 psi; Hoffman No. 508 or equal.
- B. Float Type: Maintenance free solid brass construction, continuous air venting, 150 psig standard working pressure, 240° F maximum temperature, 1/2-inch male tread at vent point for pressure testing or remote venting, 1/2 or 3/4 inch female threaded connections. Provide with mini ball valve for isolation. Taco 409, Spirotherm Spirotop VTP or approved equal.

2.03 ACCEPTABLE MANUFACTURERS - STRAINERS

- A. Bell & Gossett.
- B. Taco.
- C. Armstrong.
- D. Substitutions: Under provisions of Division 1.

2.04 STRAINERS

- A. Size 2-inch and Under: Screwed brass or iron body for 175 psig working pressure, Y pattern with 1/32-inch stainless steel perforated screen.

2.05 ACCEPTABLE MANUFACTURERS - FLOW CONTROL VALVES

- A. Griswold.
- B. FlowCon.
- C. Hydronic Components, Inc., HCI
- D. RWV Hydronic Controls.
- E. Substitutions: Under provisions of Division 1.

2.06 FLOW CONTROL VALVES

- A. Construction, Valves 2" and Smaller: ASTM B584 Brass body, rated at 300 psig @ 250 °F with union on inlet and outlet, temperature and pressure test plug on inlet.
- B. Construction, Valves larger than 2": Class 150 Flange End Valves shall consist of steel pipe with flange ends, and stainless-steel flow control cartridge assembly; 230 psig @ 250 °F; flange ends compatible with ANSI B 16.5-2017 150 lb. Steel flanges shall be permanently marked to show direction of flow.
- C. Calibration: Control flow within 5 percent of selected rating, over operating pressure range of 14 times minimum pressure required for control. Four operating pressure ranges shall be available with the minimum range requiring less than 3 psi differential pressure to actuate the mechanism.
- D. Control Mechanism: Stainless steel one-piece cartridge with segmented port design and full travel linear coil spring.
- E. Accessories:
 - 1. In-line strainer on inlet and ball valve on outlet.
 - 2. Pressure/temperature test valves.
 - 3. Provide Identification tags indelibly marked with flow rate, model number, zone identification. Tags shall be 3" x 3" aluminum.

PART 3. EXECUTION

3.01 INSTALLATION AND APPLICATION

- A. Install specialties in accordance with manufacturer's instructions to permit intended performance.
- B. Provide manual air vents at system high points and as indicated.
- C. For automatic air vents, provide vent tubing to nearest drain or back to glycol tank if in mechanical room. Where a drain is not available run discharge to a 12"x12"x6" high galvanized, water tight pan located in an accessible location.
- D. Provide valved drain and hose connection on strainer blow down connection.
- E. Provide shutoff valves on water inlet to terminal heating units such as radiation, unit heaters, and fan coil unit.

- F. Provide balancing valves on water outlet from terminal heating units.

3.02 GLYCOL APPLICATION

- A. Clean and flush piping system before adding glycol solution. See Specification Section 23 21 13 for hydronic system cleaning procedures.
- B. Feed glycol solution to system through make-up line with pressure regulator, venting system high points. Set to fill at 12 psig. Pressure system cold at 5 psig, adjust when hot to 12 psig.
- C. Perform tests determining strength of glycol and water solution and submit written test results.

3.03 AIR VENT APPLICATION SCHEDULE

Location	Type
Terminal heating units, mains below	Manual
Terminal heating units, mains above	None

Note: For terminal heating units, mains above unit, install branch piping connections at bottom of mains or 45° from bottom to allow air migration to mains.

END OF SECTION

HVAC DUCTS AND CASINGS

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SUMMARY

- A. Section Includes:
 - 1. Duct Materials.
 - 2. Ductwork Fabrication.
 - 3. Kitchen Hood Exhaust Ductwork Fabrication.

1.03 RELATED SECTIONS

- A. Division 09 91 00 - Painting
- B. Section 23 07 00 – HVAC Insulation: Product requirements for duct liners for placement by this section.

1.04 REFERENCES

- A. ASTM International:
 - 1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
 - 2. ASTM A90/A90M - Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
 - 3. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - 4. ASTM A568/A568M - Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.
 - 5. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

6. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
8. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
9. ASTM C14 - Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.
10. ASTM C443 - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
11. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. Sheet Metal and Air Conditioning Contractors:

1. SMACNA - Fibrous Glass Duct Construction Standards.
2. SMACNA - HVAC Air Duct Leakage Test Manual.
3. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

C. Underwriters Laboratories Inc.:

1. UL 181 - Factory-Made Air Ducts and Connectors.

1.05 DEFINITIONS

- A. Duct Sizes: Inside clear dimensions. For lined ducts, maintain sizes inside lining.
- B. Low Pressure: Three pressure classifications: ½ inch WG positive or negative static pressure and velocities less than 2,000 fpm; 1 inch WG positive or negative static pressure and velocities less than 2,500 fpm and 2 inch WG positive or negative static pressure and velocities less than 2,500 fpm.

1.06 PERFORMANCE REQUIREMENTS

- A. Variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is not permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

1.07 SUBMITTALS

- A. See General Conditions and the General Requirements in Division 1 regarding submittals.
- B. Product Data: Submit data for duct materials, duct connectors.
- C. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA HVAC Air Duct Leakage Test Manual.
- D. Manufacturer's Installation Instructions: Submit special procedures for glass fiber ducts.

1.08 CLOSEOUT SUBMITTALS

- A. Division 1 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.09 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA - HVAC Duct Construction Standards - Metal and flexible.
- B. Construct ductwork to NFPA 90A standards.
- C. Maintain one copy of each document on site.

1.10 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years experience approved by manufacturer.

1.11 ENVIRONMENTAL REQUIREMENTS

- A. Division 1 - Product Requirements.
- B. Do not install duct sealant when temperatures are less than those recommended by sealant manufacturers.
- C. Maintain temperatures during and after installation of duct sealant.

1.12 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.13 WARRANTY

- A. Division 1 - Execution and Closeout Requirements: Product warranties and product bonds.

PART 2. PRODUCTS

2.01 DUCT MATERIALS

- A. Galvanized Steel Ducts: ASTM A653/A653M galvanized steel sheet, lock-forming quality, having G90 zinc coating of in conformance with ASTM A90/A90M.
- B. Steel Ducts: ASTM A568/A568M.
- C. Stainless Steel Ducts: ASTM A167, Type 304.
- D. Fasteners: Rivets, bolts, or sheet metal screws.

- E. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

2.02 LOW PRESSURE DUCTWORK FABRICATION

- A. Fabricate and support rectangular ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and ASHRAE handbooks, except as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
- B. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by written permission.
- C. Construct T's, bends, and elbows with minimum radius 1-1/2 times centerline duct width. Where not possible and where rectangular elbows are used, provide airfoil turning vanes. Where acoustical lining is indicated, furnish turning vanes of perforated metal with glass fiber insulation.
- D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30° divergence upstream of equipment and 45° convergence downstream.
- E. Fabricate continuously welded round and oval duct fittings two gages heavier than duct gages indicated in SMACNA Standard. Minimum 4 inch cemented slip joint, brazed or electric welded. Prime coat welded joints.
- F. Provide standard 45-degree lateral wye takeoffs. When space does not allow 45-degree lateral wye takeoff, use 90-degree conical tee connections.
- G. Provide easements where low pressure ductwork conflicts with piping and structure. Where easements exceed 10 percent duct area, split into two ducts maintaining original duct area.
- H. Connect flexible ducts to metal ducts with draw bands.
- I. Use crimp joints with or without bead for joining round duct sizes 12" and smaller with crimp in direction of airflow.
- J. Use double nuts and lock washers on threaded rod supports.

2.03 TYPE I KITCHEN HOOD EXHAUST DUCTWORK FABRICATION

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and NFPA 96.
- B. Construct of 18 gauge stainless steel using continuous external welded joints.
- C. Provide 18" from combustibles and 3" from non-combustibles.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Division 1 - Administrative Requirements: Coordination and project conditions.

- B. Verify sizes of equipment connections before fabricating transitions.

3.02 INSTALLATION

- A. Install and seal ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- B. During construction, install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- C. Use crimp joints with or without bead or beaded sleeve couplings for joining round duct sizes 12" and smaller.
- D. Install duct hangers and supports in accordance with Section 23 05 00.
- E. Use double nuts and lock washers on threaded rod supports.
- F. Set plenum doors 6 to 12 inches above floor. Arrange door swing so fan static pressure holds door in closed position.

3.03 INTERFACE WITH OTHER PRODUCTS

- A. Install openings in ductwork where required to accommodate thermometers and controllers. Install pitot tube openings for testing of systems. Install pitot tube complete with metal can with spring device or screw to prevent air leakage. Where openings are provided in insulated ductwork, install insulation material inside metal ring.
- B. Connect diffusers or light troffer boots to low pressure ducts with 5 feet maximum length of flexible duct held in place with strap or clamp.

3.04 SCHEDULES

- A. Ductwork Material Schedule:

Air System	Material
Low Pressure Supply	Steel
Return and Relief	Steel
General Exhaust	Steel
Kitchen Hood Exhaust	Stainless Steel
Dishwasher Exhaust	Stainless Steel

END OF SECTION

AIR OUTLETS AND INLETS

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 WORK INCLUDED

- A. Roof Hoods.
- B. Louvers.

1.03 REFERENCES

- A. ADC 1062 - Certification, Rating and Test Manual.
- B. AMCA 500 - Test Method for Louvers, Dampers and Shutters.
- C. ANSI/NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
- D. ARI 650 - Air Outlets and Inlets.
- E. ASHRAE 70 - Method of Testing for Rating the Air Flow Performance of Outlets and Inlets.
- F. SMACNA - HVAC Duct Construction Standard.

1.04 QUALITY ASSURANCE

- A. Test and rate performance of air outlets and inlets in accordance with ADC Equipment Test Code 1062 and ASHRAE 70.
- B. Test and rate performance of louvers in accordance with AMCA 500.

1.05 REGULATORY REQUIREMENTS

- A. Conform to ANSI/NFPA 90A.
- B. Earthquake tabs, in seismic zones, in accordance with IBC Standards.

1.06 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Provide product data for items required for this project.
- C. Review requirements of outlets and inlets as to size, finish, and type of mounting prior to submitting product data.

PART 2. PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - ROOF HOODS/LOUVERS

- A. Greenheck.
- B. Ruskin.
- C. Pace.
- D. Substitutions: Under provisions of Division 1.

2.02 ROOF HOODS

- A. Fabricate air inlet or exhaust hoods in accordance with SMACNA HVAC Duct Construction Standards.
- B. Fabricate of galvanized steel, minimum 16-gauge base and 20-gauge hood, or aluminum, minimum 16-gauge base and 18 gauge hood; suitably reinforced; with removable hood; bird screen with 1/2 inch square mesh for exhaust and 3/4 inch for intake, and factory baked enamel finish.
- C. Mount unit on minimum 24-inch-high curb base with insulation between duct and curb.
- D. Make hood outlet area minimum of twice throat area.

2.03 LOUVERS

- A. Provide 6-inch-deep louvers with blades on 45-degree slope with center baffle and return bend, heavy channel frame, bird screen with 1/2-inch square mesh.
- B. Fabricate of 16-gauge galvanized steel or 12 gauge extruded aluminum, welded assembly, with factory baked enamel finish.
- C. Furnish with interior screw holes in jambs for installation.
- D. Fabricate louver penthouses with mitered corners and reinforce with structural angles.
- E. Model ELF6375DX as manufactured by Ruskin.

PART 3. EXECUTION

3.01 INSTALLATION

- A. Install items in accordance with manufacturers' instructions.
- B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.
- C. Install diffusers to ductwork with air tight connection.
- D. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, regardless of whether dampers are specified as part of the diffuser, or grille and register assembly.
- E. Paint ductwork visible behind air outlets and inlets matte black.

END OF SECTION

BREECHINGS, CHIMNEYS, AND STACKS

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Venting for Condensing Appliances.

1.03 RELATED SECTIONS

- A. Section 23 05 00 - Common Work Results for HVAC

1.04 REFERENCES

- A. ANSI/ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- B. ANSI/ASTM A525 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- D. ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- E. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- F. ASTM C401 - Standard Classification of Alumina and Alumina-Silicate Castable Refractories.

- G. ANSI Z95.1 (NFPA 31) - Standard for the Installation of Oil Burning Equipment.
- H. ANSI Z223.1 (NFPA 54) - The National Fuel Gas Code.
- I. UL 1738 – Venting Systems for Gas-Burning Appliances.
- J. ASHRAE - Handbook, Equipment Volume, Chapter "Chimney, Gas, Vent, and Fireplace Systems."
- K. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances.
- L. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.
- M. UL 441 - Standard for Gas Vents.
- N. UL 641 - Standard for Low Temperature Venting Systems.
- O. UL 959 - Medium Heat Appliance Factory Built Chimneys.

1.05 DEFINITIONS

- A. Breeching: Vent Connector.
- B. Chimney: Primarily vertical shaft enclosing at least one vent for conducting flue gases outdoors.
- C. Smoke Pipe: Round, single wall vent connector.
- D. Vent: That portion of a venting system designed to convey flue gases directly outdoors from a vent connector or from an appliance when a vent connector is not used.
- E. Vent Connector: That part of a venting system that conducts the flue gases from the flue collar of an appliance to a chimney or vent and may include a draft control device.

1.06 DESIGN REQUIREMENTS

- A. Factory built vents and chimneys used for venting natural draft appliances shall comply with NFPA 211 and be UL listed and labeled.

1.07 QUALIFICATIONS

- A. Manufacturer: Company specializing in the manufacture of products specified in this Section with minimum three years documented experience.

1.08 REGULATORY REQUIREMENTS

- A. Conform to NFPA 54 for installation of natural gas burning appliances and equipment.
- B. Conform to NFPA 31 for installation of oil burning appliances and equipment.

1.09 SUBMITTALS

- A. Submit product data under provisions of Division 1.

- B. Shop Drawings: Indicate general construction, dimensions, weights, support and layout of breeching. Submit layout drawings indicating plan view and elevations.
- C. Product Data: Submit data indicating factory-built chimneys, including dimensional details of components and flue caps, dimensions and weights and connection requirements.
- D. Engineering Data: Submit stack sizing calculations confirming proper stack sizing for the specific equipment used on this project.
- E. Manufacturer's Installation Instructions: Submit assembly, support details, and connection requirements.
- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.10 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication, adjust layout as required to avoid conflict with structure.

PART 2. PRODUCTS

2.01 MANUFACTURERS

- A. Metalbestos.
- B. Selkirk.
- C. Schebler.
- D. Hart & Cooley.
- E. Van Packer.
- F. Substitutions: Under provisions of Division 1.

2.02 WATER HEATER VENTING

- A. Polypropylene vent pipe for use with ANSI Category II and IV gas burning appliances, including tankless and storage water heaters, high-efficiency water heaters, condensing boilers and warm air furnaces. PolyPro shall be listed to UL 1738 and is rated as a Class IIA, IIB and IIC vent system suitable for exhaust temperatures up to 230F / 110C, and a maximum positive pressure of 15 in-w.c. Duravent PolyPro Commercial or approved equal.
- B. CPVC Schedule 80 pipe shall be manufactured from a Type IV, Grade I Chlorinated Polyvinyl Chloride (CPVC) compound listed to UL 1738, consistently meeting the Quality Assurance test requirements of this standard with regard to material, workmanship, burst pressure, flattening, and extrusion quality. The pipe shall be produced in the USA using domestic materials, by an ISO 9001 certified manufacturer, and shall be stored indoors after production, at the manufacturing site, until shipped from factory. This pipe shall be suitable for venting of gas fired water heaters. Harvel, Charlotte or approved equal.
- C. Provide all accessories for a complete system including but not limited to supports, flashings, termination cap, etc.

PART 3. EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with recommendations of ASHRAE -Handbook, Equipment Volume, Chapter "Chimney, Gas, Vent, and Fireplace Systems", and NFPA 54.
- C. Level and plumb chimney and stacks.

END OF SECTION

CONVECTION HEATING AND COOLING UNITS

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Finned Tube Radiation.

1.03 RELATED SECTIONS

- A. Section 23 09 93 – Sequence of Operation for HVAC Controls.
- B. Section 23 21 13 - Hydronic Piping.
- C. Section 23 21 16 - Hydronic Specialties.

1.04 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code.

1.05 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Submit schedules of equipment and enclosures typically indicating length and number of pieces of element and enclosure, corner pieces, end caps, cap strips, access doors, pilaster covers, and comparison of specified heat required to actual heat output provided.
- C. Indicate mechanical and electrical service locations and requirements, specifically indicating deviations from indicated products.

1.06 PROJECT RECORD DOCUMENTS

- A. Submit record documents under provisions of Division 1.
- B. Accurately record actual locations of access doors in radiation cabinets required for access or valving.

1.07 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Division 1.
- B. Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listings.

1.08 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum three years' experience.

1.09 REGULATORY REQUIREMENTS

- A. Conform to applicable code for internal wiring of factory wired equipment.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site under provisions of Division 1.
- B. Store and protect products under provisions of Division 1.
- C. Protect units from physical damage by storing in protected areas and leaving factory covers in place.

1.11 SEQUENCING AND SCHEDULING

- A. Install radiation, convectors, fan-coil units, unit ventilators and radiant heaters (equipment exposed to finished areas) after walls and ceiling are finished and painted. Avoid damage.

1.12 WARRANTY

- A. Provide one year manufacturer's warranty under provisions of Division 1.

PART 2. PRODUCTS

2.01 MANUFACTURERS - FINNED TUBE RADIATION

- A. Trane.
- B. Sterling.
- C. Vulcan.
- D. Modine.

- E. Substitutions: Under provisions of Division 1.

2.02 FINNED TUBE RADIATION

- A. Heating Elements: $\frac{3}{4}$ " inch ID seamless copper tubing, 0.042 inches minimum wall thickness, mechanically expanded into evenly spaced aluminum fins, suitable for soldered fittings.
- B. Element Hangers: Quiet operating, ball bearing cradle type providing unrestricted longitudinal movement, on enclosure brackets.
- C. Enclosures: 18 gauge steel up to 18 inches in height, 16 gauge steel over 18 inches in height. Provide easily jointed components, with male/female slip joints and 14 gauge gussets, for wall to wall installation. Support rigidly, on wall or floor mounted brackets.
- D. Finish: Factory applied baked enamel of color as selected on visible surfaces of enclosure or cabinet.
- E. Damper: Where not thermostatically controlled, provide knob-operated internal damper at enclosure air outlet.
- F. Access Doors: For otherwise inaccessible valves, provide factory-made permanently hinged access doors, 6 x 7 inch minimum size, integral with cabinet.
- G. Capacity: Per plans.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work and opening dimensions are as instructed by the manufacturer.
- B. Verify that required utilities are available, in proper location, and ready for use.
- C. Beginning of installation means installer accepts existing surfaces.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Locate finned tube radiation on outside walls and run cover wall-to-wall unless otherwise indicated. Center elements under windows. Where multiple windows occur over units, divide element into equal segments centered under each window. Align cabinet joints with window mullions. Install wall angles where units butt against walls.
- C. Install cabinet unit heaters as indicated. Coordinate to assure correct recess size for recessed units.
- D. Protect units with protective covers during balance of construction.
- E. Provide hydronic units with shut-off valve on supply, shut-off valve and balancing valve on return piping. If not easily accessible, extend vent to exterior surface of cabinet for

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easy servicing. For cabinet unit heaters, fan coil units, and unit heaters, provide float operated automatic air vents with stop valve.

3.03 CLEANING

- A. Clean work under provisions of Division 1.
- B. After construction is completed, including painting, clean exposed surfaces of units. Vacuum clean coils and inside of cabinets.
- C. Touch-up marred or scratched surfaces of factory-finished cabinets, using finish materials furnished by manufacturer.
- D. Install new filters.

END OF SECTION

COMMON WORK RESULTS FOR ELECTRICAL

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. General Requirements specifically applicable to Division 26, in addition to Division 1 provisions.
- B. The electrical system equipment and installation shall comply with all provisions and requirements of this specification, as well as any and all applicable national, state and local codes and standards.

1.03 WORK SEQUENCE

- A. Construct Work in sequence under provisions of Division 1.

1.04 COORDINATION

- A. Coordinate the Work specified in this Division under provisions of Division 1.
- B. Prepare drawings showing proposed rearrangement of Work to meet job conditions, including changes to Work specified under other Sections. Obtain permission of Architect prior to proceeding.

1.05 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code, latest adopted edition including all state and local amendments.
- B. NECA - Standard of Installation.

- C. NETA ATS – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- D. ANSI/IEEE C2 - National Electrical Safety Code latest adopted edition.
- E. Electrical Reference Symbols: The Electrical "Legend" on drawings is standardized version for this project. All symbols shown may not be used on drawings. Use legend as reference for symbols used on plans.
- F. Electrical Drawings: Drawings are diagrammatic; complimentary to the Architectural drawings; not intended to show all features of work. Install material not dimensioned on drawings in a manner to provide a symmetrical appearance. Do not scale drawings for exact equipment locations. Review Architectural, Civil, Structural, and Mechanical Drawings and adjust work to conform to conditions shown thereon. Field verification of dimensions, locations and levels is directed.

1.06 REGULATORY REQUIREMENTS

- A. Conform to ANSI/NFPA 70.
- B. Conform to the latest adopted edition of the International Building Code and the International Fire Code including all state and local amendments thereto.
- C. Conform to ANSI/IEEE C2.
- D. Obtain electrical permits, plan review, and inspections from authority having jurisdiction.

1.07 SUBMITTALS

- A. Submittal review is for general design and arrangement only and does not relieve the Contractor from any requirements of Contract Documents. Submittal not checked for quantity, dimension, fit or proper operation. Where deviations of substitute product or system performance have not been specifically noted in the submittal by the Contractor, provisions of a complete and satisfactory working installation are the sole responsibility of the Contractor.
- B. In addition to requirements referenced in Division 1, the following is required for work provided under this division of the specification.
 - 1. Provide material and equipment submittals containing complete listings of material and equipment shown on Electrical Drawings and specified herein. Separate from work furnished under other divisions.
 - 2. Submittals shall be provided in PDF format with each section indexed in the PDF document. Submittals for Division 26 shall be complete and submitted at one time. Unless given prior approval, partial submittals will be returned unreviewed.
 - 3. Clearly identify all material and equipment by item, name or designation used on drawings and in specifications.
 - 4. Submit only pages which are pertinent; mark catalog sheets to identify pertinent products, referenced to Specification Section and Article number. Show reference standards, performance characteristics, and capacities; wiring diagrams and controls; component parts; finishes; dimensions; and required clearances.
 - 5. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the work. Delete information not applicable.

6. Review submittals prior to transmittal; determine and verify field measurements, field construction criteria, manufacturer's catalog numbers, and conformance of submittal with requirements of Contract Documents.
7. Coordinate submittals with requirements of work and of Contract Documents.
8. Certify in writing that the submitted shop drawings and product data are in compliance with requirements of Contract Documents. Notify Architect/Engineer in writing at time of submittal, of any deviations from requirements of Contract Documents.
9. Do not fabricate products or begin work which requires submittals until return of submittal with Architect/Engineer acceptance.
10. Equipment scheduled by manufacturer's name and catalog designations, manufacturer's published data and/or specification for that item, in effect on bid date, are considered part of this specification. Approval of other manufacturer's item proposed is contingent upon compliance therewith.

1.08 SUBSTITUTIONS

- A. In accordance with the General Conditions and the General Requirements, Substitution and Product Options, all substitute items must fit in the available space, and be of equal or better-quality including efficiency performance, size, and weight, and must be compatible with existing equipment.

1.09 PROJECT RECORD DRAWINGS

- A. Maintain project record drawings in accordance with Division 1.
- B. In addition to the other requirements, mark up a clean set of drawings as the work progresses to show the dimensioned location and routing of all electrical work which will become permanently concealed. Show routing of work in permanently concealed blind spaces within the building. Show complete routing and sizing of any significant revisions to the systems shown.
- C. Record drawing field mark-ups shall be maintained on-site and shall be available for examination of the Owner's Representative at all times.

1.10 OPERATION AND MAINTENANCE MANUALS

- A. Provide operation and maintenance manuals for training of Owner's Representative in operation and maintenance of systems and related equipment. In addition to requirements referenced in Division 1, the following is required for work provided under this section of the specifications.
- B. Manuals shall be separate from work furnished under other divisions. Prepare a separate chapter for instruction of each class of equipment or system. Index and clearly identify each chapter and provide a table of contents.
- C. Unless otherwise noted in Division 1, provide one copy of all material for approval.
- D. The following is the suggested outline for operation and maintenance manuals and is presented to indicate the extent of items required in manuals.
 1. List chapters of information comprising the text. The following is a typical Table of Contents:

- a. Electrical power distribution.
 - b. Security system.
 - c. Other chapters as necessary.
2. Provide the following items in sequence for each chapter shown in Table of Contents:
- a. Describe the procedures necessary for personnel to operate the system including start-up, operation, emergency operation and shutdown.
 - 1) Give complete instructions for energizing equipment and making initial settings and adjustments whenever applicable.
 - 2) Give step-by-step instructions for shutdown procedure if a particular sequence is required.
 - 3) Include test results of all tests required by this and other sections of the specifications.
 - b. Maintenance Instructions:
 - 1) Provide instructions and a schedule of preventive maintenance, in tabular form, for all routine cleaning and inspection with recommended lubricants if required for the following:
 - a) Distribution equipment.
 - b) Security systems.
 - 2) Provide instructions for minor repair or adjustments required for preventive maintenance routines, limited to repairs and adjustments which may be performed without special tools or test equipment and which requires no special training or skills.
 - 3) Provide manufacturers' descriptive literature including approved shop drawings covering devices used in system, together with illustrations, exploded views, etc. Also include special devices provided by the Contractor.
 - 4) Provide any information of a maintenance nature covering warranty items, etc., which have not been discussed elsewhere.
 - 5) Include list of all equipment furnished for project, where purchased, technical representative if applicable and a local parts source with a tabulation of descriptive data of all electrical-electronic spare parts and all mechanical spare parts proposed for each type of equipment or system. Properly identify each component by part number and manufacturer.
 - c. Inspection Certificate: Include copy of certificate of final inspection and acceptance from the Authority Having Jurisdiction.

1.11 DEMONSTRATION OF ELECTRICAL SYSTEMS

- A. During substantial completion inspection:
1. Conduct operating test for approval under provisions of Division 1.
 2. Demonstrate installation to operate satisfactorily in accordance with requirements of Contract Documents.
 3. Should any portion of installation fail to meet requirements of Contract Documents, repair or replace items failing to meet requirements until items can be demonstrated to comply.
 4. Have instruments available for measuring light intensities, voltage and current values, and for demonstration of continuity, grounds, or open circuit conditions.
 5. Provide personnel to assist in taking measurements and making tests.

1.12 WARRANTY

- A. In addition to the requirements of Division 1, or as specified in other sections. Warrant all materials, installation and workmanship for one (1) year from date of acceptance.
- B. Copies of manufacturer product warranties for all equipment shall be included in the operation and installation manuals.

1.13 INSTRUCTION OF OPERATING PERSONNEL

- A. In accordance with the requirements of Division 1 and this section provide services of qualified representative of supplier of each item or system listed below to instruct designated personnel of Owner in operation and maintenance of item or system.
- B. Make instruction when system is complete, of number of hours indicated, and performed at time mutually agreeable.

System or Equipment	Hours of Instruction
Security system	4
Video Surveillance	4

- C. Certify that an Anchorage based authorized service organization regularly carries complete stock of repair parts for listed equipment or systems, that organization is available and will furnish service within 48 hours after request. Include name, address and telephone number of service organization.
- D. Have approved operation and maintenance manuals and parts lists for all equipment on hand at time of instruction.

PART 2. PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. All Materials and Equipment shall be new.
- B. All Materials and Equipment shall be listed by Underwriter's Laboratories or equivalent third party listing agency for the use intended.
- C. Materials and Equipment shall be acceptable to the authority having jurisdiction as suitable for the use intended when installed per listing and labeling instructions.

- D. No materials or equipment containing asbestos in any form shall be used. Where materials or equipment provided by this Contractor are found to contain asbestos such items shall be removed and replaced with non-asbestos containing materials and equipment at no cost to the Owner.
- E. In describing the various items of equipment, in general, each item will be described singularly, even though there may be numerous similar items.

PART 3. EXECUTION

3.01 WORKMANSHIP

- A. Install Work using procedures defined in NECA Standard of Installation and/or the manufacturer's installation instructions.

3.02 TESTS

- A. Perform tests in accordance with Section 260126 – Maintenance Testing of Electrical Systems.
- B. Notify the Owner's representative at least 72 hours prior to conducting any tests.
- C. Following completion of installation, test system ground in accordance with the requirements of NETA ATS 7.13. and all feeders in accordance with NETA ATS 7.3. Submit logs of values obtained, and nameplate data of instruments used prior to final inspection. Include a copy of all data in the power distribution section of the Operation and Maintenance Manuals.
- D. Perform additional tests required under other sections of these specifications.
- E. Perform all tests in the presence of the Owner's representative.
- F. The Contractor shall provide written notification to the Owner's representative and the State Electrical Inspector thirty days in advance of requests for rough-in and substantial completion inspections.

3.03 PENETRATIONS OF FIRE BARRIERS

- A. Related information to this section appears in Division 7, Fire Stopping.
- B. All holes or voids created to extend electrical systems through fire rated floors, walls or ceiling shall be sealed with an asbestos-free intumescent fire stopping material capable of expanding 8 to 10 times when exposed to temperatures 250°F or higher.
- C. Materials shall be suitable for the fire stopping of penetrations made by steel, glass, plastic and shall be capable of maintaining an effective barrier against flame, smoke and gases in compliance with the requirements of ASTM E814 and UL 1479.
- D. The rating of the fire stops shall be the same as the time-rated floor, wall or ceiling assembly.
- E. Install fire stopping materials in accordance with the manufacturer's instructions.

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- F. Unless protected from possible loading or traffic, install fire stopping materials in floors having void openings of four (4) inches or more to support the same floor load requirements as the surrounding floor.
- G. Seal cable tray penetrations of fire rated floors, walls or ceilings with UL listed, reusable fire stop sealing bags.

END OF SECTION

SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Electrical Demolition.

1.03 RELATED SECTIONS

- A. Division 1 - Alteration Project Procedures.
- B. Division 2 - Minor Demolition for Remodeling.

PART 2. PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work: As specified in individual Sections.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Verify field measurements and circuiting arrangements are as shown on Drawings.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition Drawings are based on a non-destructive walkthrough and existing record documents. Report discrepancies to Architect/Engineer before disturbing existing installation.

- D. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- B. Coordinate utility service outages with Utility Company.
- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Demolish and extend existing electrical work under provisions of Division 1, Division 2, and this Division.
- B. Remove, relocate, and extend existing installations to accommodate new construction.
- C. Remove abandoned wiring to source of supply.
- D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- E. Where abandoned conduit is installed below existing slab not scheduled for demolition, remove the conductors, cut conduit flush with floor, and patch surface.
- F. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not removed.
- G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- H. Repair adjacent construction and finishes damaged during demolition and extension work. T-bar ceiling tiles damaged under normal construction conditions or having voids where junction boxes were removed shall be replaced by the Contractor.
- I. Maintain access to existing electrical installations which remain active.
- J. Extend existing installations using materials and methods as specified.
- K. Where materials or equipment are to be turned over to Owner or reused and installed by the Contractor, it shall be the Contractor's responsibility to maintain condition of materials and equipment equal to the existing condition of the equipment before the work began. Repair or replace damaged materials or equipment at no additional cost to the Owner.
- L. Relocate existing lighting fixtures as indicated on Drawings. Test fixture to see if it is in good working condition before installation at new location.
- M. Contractor to field verify conduits and electrical items in walls to be demolished prior to start of work. Demolish conduits, boxes, devices, equipment, etc. In walls that are scheduled for demolition. Where conduits pass through the walls or circuits are shared with equipment that is existing to remain, provide all work necessary (including extending

and re-routing conduits) to maintain access and provide electrical continuity to existing systems and circuitry.

3.04 EXISTING PANELBOARDS

- A. Ring out circuits in existing panel affected by the Work. Where additional circuits are needed, reuse circuits available for reuse.
- B. Tag unused circuits as spare.
- C. Where existing circuits are indicated to be reused, use sensing measuring devices to verify circuits feeding Project area or are not in use.
- D. Remove existing wire no longer in use from panel to equipment.
- E. Provide new updated directories where more than three circuits have been modified or rewired.

3.05 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment which remain or are to be reused.
- B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions.

3.06 INSTALLATION

- A. Install relocated materials and equipment under the provisions of Division 1.

END OF SECTION

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Building Wire.
- B. Cable.
- C. Wiring Connections and Terminations.

1.03 RELATED SECTIONS

- A. Section 26 05 53 – Identification for Electrical Systems.

1.04 REFERENCES

- A. ANSI/NEMA WC 70-2021 – Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy.
- B. NETA ATS – Acceptance testing specifications for Electrical Power Distribution and Systems.
- C. NFPA 262 – Standard Method of test for flame travel and smoke of wires and cables for use in air-handling spaces.
- D. UL 83 – Thermoplastic Insulated Wire and Cable.
- E. UL 1063 – Standard for Machine and Tool Wire and Cable.
- F. UL 1424 – Standard for Cables for Power-Limited Fire Alarm.

- G. UL 1479 – Standard for Fire Tests of Through Wall Penetration Fire Stops.
- H. UL 1569 – Standard for Metal Clad Cable.
- I. UL 1581 – Reference Standard for Electrical Wires, Cables and Flexible Cords.

1.05 SUBMITTALS

- A. Submit data under provisions of Division 1 and Section 26 05 00.
- B. Product Data: Submit product data for all components provided which fall under this section showing configurations, finishes, and dimensions. Each catalog sheet should be clearly marked to indicate exact part number provided, including all options and accessories.
- C. Submittals are not requested for this section.

1.06 QUALITY ASSURANCE

- A. Provide wiring materials located in plenums with peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet (1.5m) when tested in accordance with NFPA 262.

PART 2. PRODUCTS

2.01 BUILDING WIRE

- A. Thermoplastic-insulated Building Wire: NEMA WC 70.
- B. Feeders and Branch Circuits 6 AWG and Smaller: Copper conductor, 600 volt insulation, THHN/THWN or XHHW-2. 6 and 8 AWG, stranded conductor; smaller than 8 AWG, solid or stranded conductor.
- C. Branch Circuit Wire Color Code:
 - 1. Color code wires by line or phase as follows:
 - a. Black, red, blue and white for 120/208V systems.
 - 2. For conductors 6 AWG and smaller, insulation shall be colored. For conductors 4 AWG and larger, identify with colored phase tape at all terminals, splices, and boxes.
 - 3. Grounding conductors 6 AWG and smaller shall have green colored insulation. For 4 AWG and larger, use green tape at both ends and at all other visible points in between, including pull and junction boxes.
- D. Control Circuits: Copper, stranded conductor 600 volt insulation, THHN/THNN or XHHW-2.
- E. Wire and cables in cable trays shall be specifically approved for installation in cable trays.

2.02 REMOTE CONTROL AND SIGNAL CABLE

- A. Control Cable for Class 1 Remote Control and Signal Circuits: Copper conductor, 600 volt insulation, rated 90° C, individual conductors twisted together, shielded, and covered with an overall PVC jacket; UL listed.
- B. Control Cable for Class 2 or Class 3 Remote Control and Signal Circuits: Copper conductor, 300 volt insulation, rated 90° C, individual conductors twisted together, shielded or unshielded (as required), and covered with a PVC jacket; UL listed.
- C. Plenum Cable for Class 2 or Class 3 Remote Control and Signal Circuits: Copper conductor, 300 volt insulation, rated 90° C, individual conductors twisted together, shielded or unshielded (as required), and covered with a nonmetallic jacket; UL listed for use in air handling ducts, hollow spaces used as ducts, and plenums.

2.03 WIRING CONNECTIONS AND TERMINATIONS

- A. For conductors 8 AWG and smaller:
 - 1. Dry interior areas: Spring wire connectors, pre-insulated "twist-on" rated 105 degrees C per UL 468C. Where stranded conductors are terminated on screw type terminals, install crimp insulated fork or ring terminals. Thomas & Betts Sta-Kon or equal.
 - 2. Wet or exterior: Spring wire connectors, pre-insulated "twist-on", resin filled rated for direct burial per UL 486D.

PART 3. EXECUTION

3.01 GENERAL WIRING METHODS

- A. Use no wire smaller than 12 AWG for power circuits, and no smaller than 18 AWG for control wiring.
- B. Use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 75 feet.
- C. Splice only in junction or outlet boxes.
- D. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- E. Make Conductor lengths for parallel circuits equal.
- F. Do not share neutral conductors. Provide a dedicated neutral conductor for each branch circuit that requires a neutral.

3.02 WIRING INSTALLATION IN RACEWAYS

- A. Pull all conductors into a raceway at the same time. Verify that raceway is complete and properly supported prior to pulling conductors.
- B. Install wire in raceway after interior of building has been physically protected from the weather and all mechanical work likely to injure conductors has been completed.

- C. Do not install XHHW-2 conductors when ambient temperatures are below 23F and THHN/THWN conductors when ambient temperatures are below 32F.
- D. Conductors shall be carefully inspected for insulation defects and protected from damage as they are installed in the raceway. Where the insulation is defective or damaged, the cable section shall be repaired or replaced at the discretion of the Owner and at no additional cost to the Owner.
- E. Place an equal number of conductors for each phase of a circuit in same raceway or cable.
- F. Route conductors from each system in independent raceway system and not intermix in the same raceway, enclosure, junction box, wireway, or gutter as another system unless otherwise shown on the plans.
- G. No more than six current carrying conductors shall be installed in any homerun unless otherwise indicated on the drawings or without prior approval from the Engineer.
- H. Completely and thoroughly swab raceway system before installing conductors.
- I. When two or more neutrals are installed in one conduit, identify each with the proper circuit number in accordance with Section 26 05 53.

3.03 CABLE INSTALLATION

- A. Provide protection for exposed cables where subject to damage.
- B. Support cables above accessible ceilings; do not rest on ceiling tiles. Use spring metal clips or cable ties to support cables from structure. Do not support cables from ceiling suspension system. Include bridle rings or drive rings.
- C. Use suitable cable fittings and connectors.
- D. Trench and backfill for direct buried cables per Division 31. Install warning tape along entire length of direct burial cables.

3.04 WIRING CONNECTIONS AND TERMINATIONS

- A. Stranded wire shall not be wrapped around screw terminals.
- B. Splice only in accessible junction boxes.
- C. Thoroughly clean wires before installing lugs and connectors.
- D. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.
- E. Terminate spare conductors with twist on connectors or heat shrink insulation to proper voltage rating.
- F. Control systems wiring in conjunction with mechanical, electrical or miscellaneous equipment to be identified in accordance with wiring diagrams furnished with equipment.

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- G. Code sound and signal systems wiring and any special equipment in accordance with manufacturer's diagrams or recommendations.
- H. Do not exceed manufacturer's recommended pull tensions.
- I. Use suitable reducing connectors or mechanical connector adapters for connecting aluminum conductor to copper conductors.

3.05 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Division 1.
- B. Inspect wire and cable for physical damage and proper connection.
- C. Torque conductor connections and terminations to manufacturer's recommended values.

3.06 WIRE AND CABLE INSTALLATION SCHEDULE

- A. All Locations: Building wire and/or remote control and signal cable in raceways.

END OF SECTION

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Power System Grounding.
- B. Communication System Grounding.
- C. Electronic Safety and Security System Grounding.
- D. Electrical Equipment and Raceway Grounding and Bonding.

1.03 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 1 General Requirements, Section 26 05 00 – Common Work Results for Electrical, Division 27 and Division 28.
- B. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.

1.04 REFERENCE STANDARDS

- A. ASTM B 3 – Standard Specification for Soft or Annealed Copper Wire.
- B. IEEE Std 81 – Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System.
- C. IEEE Std 142 – Recommended Practice for Grounding of Industrial and Commercial Power System.

- D. UL 467 – Standard for Grounding and Bonding Equipment.

1.05 SYSTEM DESCRIPTION

- A. Provide a complete grounding system for services and equipment as required by State and Local Codes, NEC, applicable portions of other NFPA codes, and as indicated herein.

1.06 SUBMITTALS

- A. Product Data: Submit product data for all components provided, showing material type and dimensions. Each catalog sheet should be clearly marked to indicate exact part number provided, including all options and accessories.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Grounding Conductors: Copper conductor bare or green insulated.

PART 3. EXECUTION

3.01 INSTALLATION

- A. Provide a separate, insulated equipment-grounding conductor in all feeder and branch circuits. Terminate each end on a grounding lug, bus, or bushing. Multiple conductors on single lug not permitted. Each grounding conductor shall terminate on its own terminal lug.
- B. Connect grounding electrode conductors to metal water pipe using a suitable ground clamp. Make connections to flanged piping at street side of flange. Provide bonding jumper around water meter and back flow preventors.
- C. Bond together exposed non-current carrying metal parts of electrical equipment, metal raceway systems, and grounding conductor in raceways and cables.
- D. Grounding conductors for branch circuits shall be sized in accordance with NEC, except minimum size grounding conductor shall be No. 12 AWG.
- E. Grounding conductor is in addition to neutral conductor and in no case shall neutral conductor serve as grounding means.

3.02 FIELD QUALITY CONTROL

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.
- B. Continuity Test: Continuity test shall be performed on all power receptacles to ensure that the ground terminals are properly grounded to the facility ground system.

END OF SECTION

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Section included hangers and supports for Power Systems, Communication Systems and Electronic Safety and Security Systems.
- B. Conduit Supports.
- C. Formed Steel Channel.
- D. Spring Steel Clips.
- E. Sleeves.
- F. Mechanical Sleeve Seals.
- G. Equipment Bases and Supports.

1.03 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 1 General Requirements, and Section 26 05 00 – Common Work Results for Electrical, Division 27 and Division 28.

1.04 REFERENCES

- A. International Building Code (IBC), Chapter 16 – Structural Design.

1.05 SUBMITTALS

- A. Division 1: Requirements for submittals.
- B. Product Data: Submit product data for specialty supports.

1.06 COORDINATION

- A. Coordinate size, shape and location of concrete pads with Division 3.

1.07 QUALITY ASSURANCE

- A. Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry.

PART 2. PRODUCTS

2.01 CONDUIT SUPPORTS

- A. Manufacturers:
 - 1. Allied Tube & Conduit Corp.
 - 2. Minerallac Fastening Systems.
 - 3. O-Z Gedney Co.
 - 4. Substitutions: per Division 1
- B. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.
- C. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.
- D. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.
- E. Conduit clamps - general purpose: One-hole malleable iron for surface mounted conduits.
- F. Cable Ties: High strength nylon temperature rated to 185 degrees F. self-locking.

2.02 FORMED STEEL CHANNEL

- A. Manufacturers:
 - 1. B-Line Systems.
 - 2. Allied Tube & Conduit Corp.
 - 3. Unistrut Corp.
 - 4. Substitutions: per Division 1.
- B. Product Description: Galvanized 12 gage thick steel. With holes 1-1/2 inches on center.

2.03 SLEEVES

- A. Sleeves Through Non-fire Rated Floors: 18 gage thick galvanized steel.
- B. Sleeves Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage thick galvanized steel.
- C. Sleeves Through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, UL listed.
- D. Fire-stopping Insulation: Glass fiber type, non-combustible.

2.04 MECHANICAL SLEEVE SEALS

- A. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Division 1: Verification of existing conditions before starting work.
- B. Verify openings are ready to receive sleeves.

3.02 PREPARATION

- A. Obtain permission from Owner's Representative before using powder-actuated anchors.
- B. Obtain permission from Owner's Representative before drilling or cutting structural members.

3.03 INSTALLATION - GENERAL

- A. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using precast insert system, expansion anchors, preset inserts, beam clamps, or spring steel clips.
- B. Use toggle bolts or hollow wall fasteners in hollow masonry partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchor on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.
- C. Do not fasten supports to piping, ductwork, mechanical equipment, conduit, or ceiling suspension system.
- D. Do not penetrate by drilling or screwing into metal roof decking. All penetrations into metal roof decking must be approved by the Project Manager in writing.
- E. Fabricate supports from structural steel or steel channel, bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

Division 26
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- F. Securely fasten equipment to building structure in accordance with manufacturer's recommendations and to provide necessary earthquake anchorage.
- G. Power-driven fasteners are prohibited for tension load applications (such as supporting luminaries or conduit racks from ceiling above). Use drilled-in expansion anchors or drilled and screw-in anchors such as Kwik-Con II or Tapcon.

3.04 INSTALLATION - SLEEVES

- A. Exterior watertight entries: Seal with adjustable interlocking rubber links.
- B. Conduit penetrations not required to be watertight: Sleeve and fill with silicon foam.
- C. Set sleeves in position in forms. Provide reinforcing around sleeves.
- D. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- E. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.
- F. Where conduit or raceway penetrates floor, ceiling, or wall, close off space between conduit or raceway and adjacent work with insulation and caulk. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

END OF SECTION

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Conduit.
- B. Surface Mounted Raceways.
- C. Boxes.
- D. Wireway

1.03 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 1 General Requirements, Division 26 and Division 28.
- B. Division 7 Thermal and Moisture Protection.
- C. Division 8 Openings: Access Doors and Frames.
- D. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.
- E. Section 26 05 26 – Grounding and Bonding for Electrical Systems.
- F. Section 26 05 29 – Hangers and Supports for Electrical Systems.
- G. Section 26 05 53 – Identification for Electrical Systems.

1.04 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
 - 2. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM A 123 – Specification for Zinc Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strip.
- C. National Electrical Manufacturers Association (NEMA):
 - 1. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
 - 2. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
 - 3. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- D. Telecommunications Industry Association (TIA) and Electronics Industries Association (EIA):
 - 1. ANSI/TIA/EIA 568 Commercial Building Telecommunications Cabling Standard.
- E. Building Industry Consulting Service International (BICSI):
 - 1. BICSI Telecommunication Design Methods Manual.

1.05 RACEWAY AND BOX INSTALLATION SCHEDULE

- A. In or through CMU walls:
 - 1. Raceway: Provide rigid steel conduit or intermediate metal conduit. EMT conduit may penetrate through CMU walls where the EMT is installed in a sleeve and does not come in direct contact with the CMU. All conduit in contact with concrete or block shall be rigid steel conduit half lapped wrapped with pipe wrap or be plastic-coated conduit.
 - 2. Boxes and Enclosures: Provide concrete tight cast and listed sheet metal boxes.
- B. Outdoor Above Grade, Damp or Wet Interior Locations:
 - 1. Raceway: Provide rigid steel conduit or intermediate metal conduit.
 - 2. Boxes and Enclosures: Provide weatherproof malleable iron for branch circuit junction and outlet boxes. Provide weatherproof NEMA 3R sheet metal enclosures for safety and disconnect switches and NEMA 4 sheet metal enclosures with gaskets for motor controllers and control panels.
 - 3. Fittings: Provide galvanized malleable iron with gaskets. Provide Myers threaded hubs for all conduit entries into top and side of sheet metal enclosures.
- C. Concealed Dry Locations:
 - 1. Raceway: Provide rigid steel conduit, intermediate metal conduit, or electrical metallic tubing.
 - 2. Boxes and Enclosures: Provide sheet-metal boxes.
 - 3. Fittings: Provide galvanized malleable iron and steel.

D. Exposed Dry Locations:

1. Raceway: Provide rigid steel conduit, intermediate metal conduit, or electrical metallic tubing.
2. Boxes and Enclosures: Provide sheet-metal boxes with raised steel covers.
3. Fittings: Provide galvanized malleable iron and steel.
4. Surface Raceway and Boxes: Where specifically noted on the Drawings, provide surface raceway and boxes.

1.06 DESIGN REQUIREMENTS

A. Raceway Minimum Size:

1. Provide 1/2 inch minimum, unless otherwise noted.
2. Line Voltage Circuits: Raceway is sized on the drawings for copper conductors with 600-Volt type XHHW insulation, unless otherwise noted. Where a raceway size is not shown on the drawings, it shall be calculated to not exceed the percentage fill specified in the NEC Table 1, Chapter 9 using the conduit dimensions of the NEC Table 4, Chapter 9 and conductor properties of the NEC Table 5, Chapter 9.
3. Low-Voltage Circuits: Raceway size shall be calculated to not exceed the percentage fill specified in the NEC Table 1, Chapter 9, using the conduit dimensions of the NEC Table 4, Chapter 9, and cable diameter provided by the manufacturer.

- B. Box Minimum Size: Provide all boxes sized and configured per NEC Article 370 and as specified in this section.

1.07 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Product Data: Submit data for products.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

PART 2. PRODUCTS

2.01 RIGID METAL CONDUIT (RMC)

- A. Rigid Steel Conduit: ANSI C80.1, UL 6.
- B. Rigid Aluminum Conduit: ANSI C80.5.
- C. Fittings and Conduit Bodies: NEMA FB 1, UL 514B; Galvanized malleable iron with threaded hubs for all conduit entries. Provide threaded connections and couplings only. Set Screw and running thread fittings are not permitted.
- D. Provide insulated throat bushings at all conduit terminations.

2.02 INTERMEDIATE METAL CONDUIT (IMC)

- A. Product Description: ANSI C80.6, UL 1242; Galvanized Steel Conduit.
- B. Fittings and Conduit Bodies: NEMA FB 1, UL 514B; use fittings and conduit bodies specified above for rigid steel conduit.
- C. Provide insulated throat bushings at all conduit terminations.

2.03 FLEXIBLE METAL CONDUIT (FMC)

- A. Product Description: UL 1, FS WW-C-566; galvanized or zinc-coated flexible steel, full-wall or reduced wall thickness.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel or malleable iron with insulated throat bushings. Die cast zinc or threaded inside throat fittings are not acceptable.

2.04 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

- A. Product Description: UL 360, flexible metal conduit with interlocked steel construction and PVC jacket.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; liquid tight steel or malleable iron with insulated throat bushings. Die cast fittings are not acceptable.

2.05 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3, UL 797; galvanized steel tubing.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel or malleable iron, compression or set screw type with insulated throat bushings. Zinc die cast or indented fittings are not acceptable.
- C. Provide factory elbows on sizes 1-1/2" and larger.

2.06 SURFACE METAL RACEWAY

- A. General Requirements: Surface steel raceway with ivory finish, fitted snap-on cover, and steel accessories, suitable for use as multi-outlet assembly. Keep data and power conductors separate at all times. Provide radius fittings and all other accessories as required for a complete installation. Raceway covers with knockouts for accessories or cable entries are not acceptable. Device spacing shall be as indicated on the Drawings.
- B. Single-Channel, Power and Data: Basis of Design is Wiremold V2000 series.

2.07 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, UL514A galvanized steel, with plaster ring where applicable.
 - 1. Minimum Size: 4 inches square or octagonal, 1-1/2 inches deep, unless otherwise noted.
 - 2. Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch male fixture studs where required. Minimum Size: 4 inches square or octagonal, 2-1/8 inches deep.

3. Telecommunications Outlets: Minimum size 4-11/16 inches square, 2-1/8 inches deep.
- B. Cast Boxes: NEMA FB 1, Type FD, galvanized malleable iron or copper-free cast aluminum. Furnish gasketed cover by box manufacturer. Furnish threaded hubs. "Bell" boxes are not allowed.

2.08 PULL AND JUNCTION BOXES

- A. Sheet Metal Pull and Junction Boxes: ANSI/NEMA OS 1, UL514A galvanized steel.
 1. Minimum Size: 4 inches square or octagonal, 1-1/2 inches deep, unless otherwise noted.
- B. Sheet Metal Boxes Larger Than 12 Inches in Any Dimension: Hoffman or approved equal.
- C. Boxes for Outdoor and Wet Location Installations: NEMA 250, Type 4 or 4X; flat-flanged, surface mounted junction box:
 1. Material: Galvanized cast iron.
 2. Cover: Furnish with ground flange, neoprene gasket, and stainless-steel cover and screws.

2.09 BUSHINGS

- A. Non-grounding: Threaded impact resistant plastic.
- B. Grounding: Insulated galvanized malleable iron/steel with hardened screw bond to raceway and conductor lug.

2.10 LOCKNUTS

- A. Threaded Electro Zinc Plated Steel designed to cut through protective coatings for ground continuity.

PART 3. EXECUTION

3.01 INSTALLATION

- A. Ground and bond raceway and boxes in accordance with Section 26 05 26.
- B. Provide support and fasten raceway and box supports to structure and finishes in accordance with Section 26 05 29.
- C. Identify raceway and boxes in accordance with Section 26 05 53.
- D. Unless otherwise noted, do not inter-mix conductors from separate panelboards or any other system in the same raceway system or junction boxes.

3.02 INSTALLATION - GENERAL RACEWAY

- A. Install raceway for all systems, unless otherwise noted.

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- B. Install an equipment grounding conductor inside of all raceways containing line voltage conductors.
- C. Provide raceways concealed in construction unless specifically noted otherwise, or were installed at surface cabinets and equipment connections and in Mechanical and Electrical Equipment rooms. Do not route conduits on roofs, outside of exterior walls, or along the surface of interior finished walls unless specifically noted on the plans.
- D. Raceway routing and boxes are shown in approximate locations unless dimensioned. Where raceway routing is not denoted, field-coordinate to provide complete wiring system.
- E. Do not route raceways on floor. Where surface raceways are allowed in equipment rooms, arrange raceway and boxes to maintain a minimum of 6 feet 6 inches of headroom and present a neat appearance. Install raceways level and square. Route exposed raceways and raceways above accessible ceilings parallel and perpendicular to walls, ceiling, and adjacent piping.
- F. Maintain minimum 6-inch clearance between raceway and mechanical and piping and ductwork. Maintain 12-inch clearance between raceway and heat sources such as flues, steam pipes, heating pipes, heating appliances, and other surfaces with temperatures exceeding 104 degrees F.
- G. Do not install raceway embedded in spray applied fire proofing.
- H. Route raceway through roof openings for piping and ductwork where possible; otherwise, route through roof jack with pitch pocket. Coordinate all requirements with Division 7 of these specifications.
- I. Where raceway penetrates fire-rated walls and floors, seal raceway penetrations of fire-rated walls, ceilings, floors in accordance with the requirements of Section 26 05 00 and Division 7.
- J. Raceways and boxes penetrating vapor barriers or penetrating areas from cold to warm shall be taped and sealed with a non-hardening duct sealing compound to prevent the accumulation of moisture, and shall include a vapor barrier on the outside.
- K. Conduit embedded in concrete or solid masonry shall not be larger than 1/3 the thickness of the wall or slab and shall be spaced not less than three diameters apart. No cutting of reinforcing bars shall be permitted unless specifically approved. Should structural members prevent the installation of conduit or equipment, notify the Owner or Contracting Officer before proceeding.
- L. Route conduits in slabs to have 1-inch minimum cover. Conduits in slab shall not compromise the structural integrity of the slab.
- M. Arrange raceway supports to prevent misalignment during wiring installation.
- N. Do not attach raceway to ceiling support wires or other piping systems and do not fasten raceway with wire or perforated pipe straps. Remove all wire used for temporary raceway support during construction, before conductors are pulled. Raceway shall be installed to permit ready removal of equipment, piping, ductwork, or ceiling tiles.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

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- O. Group raceway in parallel runs where practical and use conduit rack constructed of steel channel with conduit straps or clamps, as specified in Section 26 05 29. Provide space on each rack for 25 percent additional raceway.
- P. Cut conduit square; de-burr cut ends. Bring conduit to the shoulder of fittings and couplings and fasten securely.
- Q. Use threaded raintight conduit hubs for fastening conduit to cast boxes, and for fastening conduit to sheet metal boxes in damp or wet locations. Sealing locknuts are not acceptable.
- R. Install no more than 360-degrees of bends between boxes.
- S. Install conduit bodies to make sharp changes in direction, such as around beams. "Goosenecks" in conduits are not acceptable.
- T. Provide protective plastic bushings or insulated throat bushings at each raceway termination not installed to an enclosure. Bushings shall be threaded to the raceway end or connector.
- U. Avoid moisture traps; install junction box with drain fitting at low points in raceway system.
- V. Install fittings and flexible metal conduit to accommodate 3-axis movements where raceway crosses seismic joints.
- W. Install fittings designed and listed to accommodate expansion and contraction where raceway crosses control and expansion joints.
- X. Use suitable caps to protect installed raceway against entrance of dirt and moisture.
- Y. Paint all exposed conduit in finished spaces to match surface to which it is attached or crosses. Clean greasy or dirty conduit prior to painting in accordance with paint manufacturer's instructions. Where raceway penetrates non-rated ceilings, floors or walls, provide patching, paint and trim to retain architectural aesthetics similar to surroundings.

3.03 REUSE OF EXISTING CONDUITS

- A. Where shown on Drawings that existing conduits may be used, that is only applicable if the existing conduit meets the following minimum criteria:
 - 1. Conduit is sized per minimum NEC requirements.
 - 2. Conduit is properly supported as required in the Contract Documents.
 - 3. Conduit is in good, useable condition and is not deformed, damaged or showing signs of corrosion.
 - 4. Conduit is of the type specified and allowable in the Contract Documents.

3.04 INSTALLATION – GENERAL BOXES

- A. Provide electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and code compliance. All electrical box locations shown on Drawings are approximate unless dimensioned.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

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Section 26 05 33

- B. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only. Where installation is inaccessible, install outlet and junction boxes no more than 6 inches from ceiling access panel. Coordinate locations and sizes of required access doors with Division 8.
- C. Coordinate layout and installation of boxes to provide adequate headroom and working clearance and to present a neat appearance. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.
- D. Unless otherwise dimensioned on Plans, align wall-mounted outlet boxes for switches, thermostats, and similar devices.
- E. Adjust box location up to 6 feet prior to rough-in to accommodate intended purpose.
- F. Provide knockout closures for unused openings.
- G. Install boxes in walls without reducing effectiveness of wall insulation or vapor barrier.
- H. Install with minimum 24 inches separation in fire rated walls. Limit penetrations in fire rated walls to 16 square inches each and a maximum total combined penetration area of 100 square inches in any given 100 square feet of wall. Where penetrations are in excess of these requirements, provide UL listed fire stop wrap acceptable to Authority having Jurisdiction.
- I. Do not fasten boxes to ceiling support wires or other piping systems.
- J. Support boxes independently of conduit.
- K. Clean interior of boxes to remove dust, debris, and other material and clean exposed surfaces and restore finish.
- L. Provide blank covers or plates for all boxes that do not contain devices.

3.05 INSTALLATION – SURFACE RACEWAY

- A. Install screws, clips, and straps to fasten raceway channel to surfaces; mount plumb and level. Install insulating bushings and inserts at connections to outlets and corner fittings. Provide divider to keep power and data pathways separate at all times. Bond each section together to provide electrically continuous system.
- B. Close ends and unused openings in wireway and surface raceway.
- C. Where wall surface is uneven, installer shall fur out wall section to match surface raceway dimensions and surface boxes dimensions as required. Furring shall be painted to match surface raceway.
- D. Install surface raceway cover with no gaps, scratches, or deformities. Covers not acceptable to Owner shall be replaced by the Contractor at no additional cost.
- E. Cuts: Perform all cuts with raceway base and cover shear specifically designed for installed raceway system.

3.06 INSTALLATION – TELECOMMUNICATION RACEWAY AND SLEEVES

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Section 26 05 33

- A. Provide continuous pathway system for all telecommunication cables. Provide cable pathway support in accordance with Section 26 05 29.
- B. Provide separation clearances in accordance with Section 27 10 00.
- C. Install the telecommunication pathways in accordance with requirements for Installation of General Conduit and General Boxes above unless superseded by more stringent requirements of this section or ANSI/TIA568-D and the latest published edition of the BICSI Telecommunication Distribution Methods Manual guidelines and recommendations.
- D. Provide pathways for all telecommunication cables with Surface Raceway, Conduit, Cable tray, J-hooks, and chases for the entire length of each cable. Provide pathway capacity throughout entire system for each telecommunication outlet served sized to accommodate a minimum of four (or more where shown on the Plans) 4-pair 100-Ohm UTP cables from each outlet location to telecommunication room denoted on the plans.
- E. Conduit Pathways:
 - 1. Install pull boxes in continuous straight runs of conduit longer than 100 feet.
 - 2. Maximum allowable continuous conduit section length of 100 feet between pull boxes.
 - 3. Contain no more than two 90-degree bends or de-rate conduit capacity 15% for up to one additional 90-degree bend. Conduits less than 33 feet long, oversized one trade size or with one of the 90-degree bends within 12 inches of a pull box may have up to three 90-degree bends without de-rating.
 - 4. Rate each offset as a 90-degree bend.
 - 5. Bond each conduit to telecommunication ground system.
 - 6. Condulets (LB fittings) shall not be installed in any telecommunications raceway.
 - 7. Do not use flexible metal conduit unless specifically noted on the plans or approved by the engineer where it is the only practical alternative. Increase raceway one trade size above required size where flexible metal conduit is used.
 - 8. Terminate conduits routed to cable trays within 6 inches of tray. Provide conduit support to building structure within 24 inches of cable tray.
 - 9. Terminate conduits and chases that protrude through floor in telecommunication rooms to 3 inches above finished floor. Terminate conduits and chases that protrude through finished ceiling or above within 12 inches of ladder rack, distribution frame or cable organizer.
 - 10. Provide bend radius of 6 times of the internal conduit diameter of conduits up to 2 inches; 10 times of the internal conduit diameter of conduits above 2 inches and for all fiber optic raceways.
 - 11. Provide conduit pathways through walls with insulated bushings on each end for all wall penetrations of cables.
 - 12. Size all conduits, sleeves and chases according to the following table:

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Conduit Trade size	Conduit Maximum Cable Capacity Based on two 90 degree bends and < 100 ft (Inches OD of Cable)									
	(0.13")	(0.18")	(0.22")	(0.24")	(0.29")	(0.31")	(0.37")	(0.53")	(0.62")	(0.70")
0.75"	6	5	4	3	2	2	1	0	0	0
1"	8	8	7	6	3	3	2	1	0	0
1.25"	16	14	12	10	6	4	3	1	1	1
1.5"	20	18	16	15	7	6	4	2	1	1
2"	30	26	22	20	14	12	7	4	3	2
2.5"	45	40	36	30	17	14	12	6	3	3
3"	70	60	50	40	20	20	17	7	6	6
3.5"							22	12	7	6
4"							30	14	12	7

- F. Provide J-Hooks in accordance with Section 26 05 29 to provide telecommunication pathway anywhere cable tray, conduit, or ladder rack is not denoted on the plans and one or more telecommunication cables are routed.
- G. Provide innerduct the entire length in conduits denoted to contain innerducts. Size innerducts to use entire available capacity of the outer conduit.
- H. Do not install innerduct and other cables in the same raceway.

3.07 INSTALLATION – TELECOMMUNICATION BOXES

A. Boxes:

- 1. All boxes shall be readily accessible.
- 2. Do not use boxes for angle pulls or change pathway direction. Locate pull boxes in straight through sections of horizontal conduit pathways.
- 3. Provide pull boxes for 3/4-inch and 1-inch through pull for horizontal UTP cabling. Provide all other boxes sized per the following table:

Maximum Trade Size Conduit	Minimum Size of Pull Box in Inches			For each additional conduit increase width in inches
	Width	Length (direction of conduit)	Depth	
0.75"	4	12	3	2
1"	4	16	3	2
1.25"	6	20	3	3
1.5"	8	27	4	4
2"	8	36	4	5
2.5"	10	42	5	6
3"	12	48	5	6
3.5"	12	54	6	6
4"	15	60	8	8

END OF SECTION

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Nameplates
- B. Tape Labels.
- C. Wire and Cable Markers.

1.03 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 1 General Requirements, and Section 260500 – Common Work Results for Electrical.
- B. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.
- C. Section 26 05 33 – Raceway and Boxes for Electrical Systems.

1.04 SUBMITTALS

- A. Division 1 and Section 26 05 00 – Common Work Results for Electrical.
- B. Product Data:
 - 1. Submit manufacturer's catalog literature for each product required.
 - 2. Submit electrical identification schedule including list of wording, symbols, letter size, color-coding, tag number, location, and function.

1.05 ENVIRONMENTAL REQUIREMENTS

- A. Install labels and nameplates only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

PART 2. PRODUCTS

2.01 NAMEPLATES

- A. Product Description: Laminated three-layer plastic with engraved white letters on black background. Nameplate for service disconnect shall be engraved white letters on red background.
- B. Letter Size:
 - 1. 1/4-inch-high letters for identifying individual panel or equipment.
 - 2. 1/8-inch-high letters for remaining lines with 1/8 inch spacing between lines.
- C. Minimum nameplate size: 1/8 inch thick with a consistent length and height for each type of nameplate wherever installed on the project.

2.02 TAPE LABELS

- A. Product Description: Adhesive tape labels, with 3/16-inch Bold Black letters on clear background made using Dymo Rhino series label printer or approved equal.
- B. Embossed adhesive tape will not be permitted for any application.

2.03 WIRE AND CABLE MARKERS

- A. Power and Lighting Description: Machine printed heat-shrink tubing, cloth or wrap-on type, for all neutrals and Phase conductors.
- B. Low Voltage System Description: Self-adhesive machine printed label with unique wire number that is shown on shop drawing for system.
- C. Telecommunications Cable Markers: Self-laminating vinyl with translucent band and minimum 1"W x .5"H printable area with matte white finish. Brady #B-427 series or approved equal.

PART 3. EXECUTION

3.01 GENERAL INSTALLATION

- A. Degrease and clean surfaces to receive nameplates and tape labels.
- B. Install nameplates and tape labels parallel to equipment lines.

3.02 NAMEPLATE INSTALLATION

- A. Secure nameplates to equipment fronts using machine screws tapped and threaded into contactor or using rivets. The use of adhesives is not acceptable. Machine screws to not protrude more than 1/16 inch on back side.

B. Contactors:

1. Provide nameplate for each device with the following information:
 - a. Line 1: Load served.
 - b. Line 2: Panelboard and circuit number from which the device is fed.
 - c. Line 3: Fuse or Circuit amperage and poles. Where fused disconnect is installed, denote the maximum fuse size to be installed.

3.03 LABEL INSTALLATION

A. Conduit Feeder Labels - Provide conduit labels on all feeder raceways as follows:

1. Distribution Panels – “PANEL xxxx IN ROOM #xxx”.
2. Panelboards – “PANEL xxxx FED FROM MDP xxx”.

3.04 WIRE IDENTIFICATION

A. Provide wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connection. Identification shall be as follows:

1. Markers shall be located within one inch of each cable end, except at panelboards, where markers for branch circuit conductors shall be visible without removing panel deadfront.
2. Each wire and cable shall carry the same labeled designation over its entire run, regardless of intermediate terminations.
3. Color code phases, neutral, and ground per NEC requirements and Section 26 05 19.
4. Color-code all low-voltage system wires and cables in accordance with the individual sections in which they are specified.
5. For power and lighting circuits, identify with branch circuit or feeder number.
6. Control Circuits: Control wire number as indicated on schematic and shop drawings.
7. Provide cable markers on each cable, indicating device designation (e.g. “Camera 27”) for all security, intercom, door control, CCTV, MATV, and CATV systems. Cables shall be labeled at each end, as well as at any intermediate junction boxes or pullboxes.

B. Provide pull string markers at each end of all pull strings. Marker shall identify the location of the opposite end of the pull string.

3.05 JUNCTION BOX IDENTIFICATION

- A. Paint all junction boxes designated for future expansion with blue spray paint.
- B. Label each power junction box with the panelboard name and circuit number.
- C. Label all junction boxes for intercom, door control, CCTV, MATV, and CATV systems with the type of system cables contained in the box.
- D. For junction boxes above ceilings, mark the box cover with the circuit or system designation using permanent black marker. For junction boxes in finished areas, mark the inside of the cover with the circuit or system designation using permanent black marker.

3.06 DEVICE PLATE IDENTIFICATION

- A. Label each receptacle device plate or point of connection denoting the panelboard name and circuit number.
- B. Install adhesive label on the top of each plate.

3.07 LOW-VOLTAGE SYSTEM IDENTIFICATION

- A. Install all labeling in accordance with the requirements of this section and of each section where the individual systems are specified.

END OF SECTION

HEATING CABLES

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Self-regulating roof and gutter de-icing cables (inside pipe).
- B. Controls.

1.03 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 1 - General Requirements and Section 26 05 00 – Common Work Results for Electrical.
- B. Division 23.
- C. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.
- D. Section 26 05 33 – Raceway and Boxes for Electrical Systems.
- E. Section 26 05 53 – Identification for Electrical Systems: Nameplates for Heat Trace Controls.
- F. Section 26 09 19 – Enclosed Contactors: Multi-pole Contactor Control.

1.04 SUBMITTALS

- A. Product Data: Provide data for heating cable, terminations, and control components.
- B. Shop Drawings: Indicate heating cable layout, locations of terminations, thermostats, and branch circuit connections.

1.05 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Manuals: Include description of operating controls.
- B. Maintenance Data: Include repair methods, parts list of components, and instructions for testing the insulation resistance.

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum three years' experience.

1.07 WARRANTY

- A. The heat tracing cable shall be warranted against manufacturing defects for 10 years from date of shipment.

PART 2. PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS – SELF REGULATING ROOF AND GUTTER DE-ICING CABLE (INSIDE PIPE)

- A. Raychem (Pentair).
- B. Thermon.
- C. Chromalox.
- D. Substitutions: Under the provisions of Division 1.

2.02 SELF-REGULATING ROOF AND GUTTER DE-ICING CABLE (INSIDE PIPE)

- A. Heating cables installed inside roof drains, gutters, or downspout piping shall be the self-regulating type, listed for use as snow and ice de-icing cables. Typical examples of this type of application would be as follows:
 - 1. Freeze protection for roof drains and roof overflow drains, where the heating cables are physically installed inside the drain and/or drain piping.
 - 2. Freeze protection for downspout gutters, where the heating cables are physically installed inside the drain piping.
 - 3. Freeze protection for roof gutters, where the heating cables are physically located inside the gutter.
- B. The heating cable shall consist of two 16-gauge tin-coated-copper bus wires embedded in parallel in a self-regulating polymer core. Power output shall vary in response to temperature all along its length, allowing the heating cable to be crossed over itself without overheating, to be cut to length in the field. The heating cable shall be covered by a crosslinked dielectric jacket and protected by a tinned-copper braid and a modified polyolefin or fluoropolymer outer jacket.
- C. Self-regulating heating cable be manufactured and tested for a design life of 20 years based on accelerated aging techniques specified in IEEE Standards 1, 98, & 99 and UL Standard 746B.

- D. The heating cable shall be of parallel circuit construction to allow the cable to be spliced if it is inadvertently cut during or after construction, and to be powered from both ends if it becomes advantageous to divide a circuit in two.
- E. The heating cable shall operate on 120 volts without the use of transformers.
- F. Heating cables installed inside roof drains shall have a minimum nominal power output of 12W/ft at the operating voltage.
- G. The heating cable power connection and end seal terminations shall be made in an above grade in an accessible NEMA 4X junction box.
- H. Accessories shall be listed for use with the heating cable, as recommended by the manufacturer:
 - 1. Power Connection Kit: Nema 4X rated or NEMA 1 rated if installed indoors.
 - 2. End Seal Kit: NEMA 4X rated, above-insulation end seal, cold-applied.
 - 3. Splice or Tee Connection Kit: Cold-applied, low-profile re-enterable slice for in-line connection.

2.03 CONTROLS

- A. Each heating cable circuit shall be protected by a 30-mA ground-fault protection device and be provided with a disconnecting means capable of being locked in the open position.
- B. Multi-pole lighting contactor as specified in Section 26 09 19 – Enclosed Contactors.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Verify that piping is ready to receive work.
- B. Verify that required utilities are available, in proper location, and ready for use.
- C. Beginning of installation means installer accepts conditions.

3.02 INSTALLATION

- A. Install the self-regulating piping heating cables in the channels inside the water and sewer arctic piping.
- B. Where heating cables are physically attached to piping, secure cables using adhesive backed glass fiber tape at 1-foot intervals.
- C. All power termination junctions shall be installed so they are accessible.
- D. Install the roof and overflow drain de-icing cables looped inside the drain and drain piping with the power termination kit located inside the building in an accessible location.
- E. The heating cable shall be installed according to the manufacturer's recommendations, the instructions supplied with the heating cable and components.

- F. Heating-cable repairs and splices shall be made using a splice kit provided by the manufacturer and specifically approved for the purposes. They shall pass the Megger test after installation.
- G. Install caution signs or markings on maximum 20ft centers along the pipeline or vessel that is heat traced and on or adjacent to equipment in the piping system that requires periodic servicing.
- H. Do not exceed the maximum length allowable by the heat trace manufacturer for the circuit breaker installed.
- I. Clearly label any device controlling heat trace circuits with permanent markings per Section 26 05 53 – Identification for Electrical Systems.

3.03 FIELD QUALITY CONTROL

- A. Upon completion of thermal insulation installation the heater cable shall be meggered to verify no damage has occurred. Tests should use at least a 500 VDC megger. Do not use a megger with an excess of 2500 VDC. Minimum acceptable readings should be 20 megohms per circuit, regardless of length. Field megger tests shall be recorded for each heater cable, and certified reports shall be submitted to the Owner.
- B. Each circuit shall be energized and voltage and current measured and documented to verify the installation is properly functioning.
- C. Temperature controls shall be operated to verify they are functioning within the manufacturer's specifications. Initially set to turn heat trace ON when the outdoor temperature falls below 40 degrees F.

3.04 DEMONSTRATION

- A. Demonstrate operation of heating cable controls.

END OF SECTION

ENCLOSED CONTACTORS

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Enclosed Contactors.

1.03 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 1 General Requirements and Section 26 05 00 – Common Work Results for Electrical.
- B. Section 26 05 26 – Grounding and Bonding for Electrical Systems.
- C. Section 26 05 53 – Identification for Electrical Systems.
- D. Section 26 05 80 – Heating Cables

1.04 REFERENCES STANDARDS

- A. ANSI/NEMA ICS 6 - Enclosures for Industrial Controls and Systems.
- B. NEMA ICS 2 - Industrial Control Devices, Controllers, and Assemblies.

1.05 SUBMITTALS

- A. Product Data: Submit product data for all components provided, showing electrical characteristics and connection requirements. Each catalog sheet should be clearly marked exact part number provided.

- B. Shop Drawings: Submit shop drawings include outline drawings with dimensions, and equipment ratings for voltage, capacity, and poles.

1.5 CLOSEOUT SUBMITTALS

- A. Project Record Drawings: Accurately indicate actual locations of each contactor and indicate circuits controlled.
- B. Operation and Maintenance Manuals: Submit instructions for replacing and maintaining coil and contacts.

1.6 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience and ISO 9000 certified.
- B. Installer: Company specializing in installing products specified in this section with minimum three years' experience.

PART 2. PRODUCTS

2.01 MANUFACTURERS – ENCLOSED CONTACTORS

- A. Square D.
- B. Cutler Hammer.
- C. ASCO.
- D. Substitutions: Under provisions of Division 1.

2.02 ENCLOSED CONTACTORS

- A. Contactors: NEMA ICS 2; mechanically held, 2 wire control.
- B. Coil Operating Voltage: 120 volts, 60 Hertz.
- C. Multipole Lighting Contactor: NEMA ICS 2; 30A, 4-pole with coil clearing contacts, Hand-Off-Auto switch and red pilot light. Provide lockable HOA switch where controlling heat trace circuits.
- D. Enclosure: ANSI/NEMA ICS 6; Type 1.
- E. Provide solderless pressure wire terminals.

PART 3. EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Require marking of terminals and wires landing on terminals.

- C. Locate electrically held contactors where the eventual vibration and noise they will produce will not be objectionable to building occupants.

3.02 FIELD QUALITY CONTROL

- A. Verify wiring connections are tight.
- B. Verify movable contact assemblies are not binding and are free to move.
- C. Verify coil voltage is correct.
- D. With load connected energize and observe load current for each circuit installed.

END OF SECTION

PATHWAYS FOR COMMUNICATION SYSTEMS

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. J-Hooks.

1.03 RELATED SECTIONS

- A. Section 26 05 33 – Raceway and Boxes for Electrical Systems.
- B. Section 26 05 29 – Hangers and Supports for Electrical Systems
- C. Section 26 05 26 – Grounding and Bonding of Electrical Systems.
- D. Section 27 10 00 – Structured Cabling.

1.04 REFERENCES

- A. National Electric Code (NFPA 70) Article 250 - Grounding.
- B. National Electric Code (NFPA 70) Article 770 - Optical Fiber Cables and Raceways.
- C. National Electric Code (NFPA 70) Article 800 - Communications Circuits.
- D. ANSI/TIA/EIA-568-B -- Commercial Building Telecommunications Cabling Standards.
- E. BICSI Telecommunications Distribution Methods Manual - Latest published edition.
- F. UL Standards - UL 94HB, UL 723, and UL 2043.

1.05 SUBMITTALS

- A. Submit product data under provisions of Division 1.

1.06 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Division 1.

PART 2. PRODUCTS

2.01 J-HOOKS

- A. All cables not installed in conduit shall be supported using Caddy CableCat series or approved equal J-hooks with galvanized finish. J-hooks shall have a cable retainer strap to provide containment of cables within the hanger. The cable retainer strap shall be removable and reusable and be suitable for use in air handling spaces. The minimum J-hook size shall be equivalent to Caddy #Cat32. Size all J-hooks to support the quantity of cables installed, plus a minimum of 25% spare capacity. Fiber optic cables shall be routed in 1" innerduct that is supported on a separate J-hook above the J-hook supporting the copper cables.

PART 3. EXECUTION

3.01 INSTALLATION – GENERAL

- A. Provide continuous pathway system for all low voltage cable systems. Where multiple cable systems (e.g. telecom, security, intercom) are installed along the same J-hook pathway, provide separate J-hooks for each system. J-hooks may utilize the same vertical support.
- B. Coordinate all pathway runs with other trades prior to installation. Report conflicts to Owner.
- C. Maintain a minimum EMI separation clearance in conformance with Section 27 10 00.
- D. Support pathway from building to support structure or sub structure in accordance with Section 26 05 29. Do not support pathway from ceiling tiles, ceiling grid, hanger wires, ductwork, piping, or other equipment hangers that are not part of the cable pathway support system.
- E. In classrooms and other areas with accessible ceilings where cable is not installed in cable tray, provide J-hooks spaced every 4 to 5 feet, varying the distance between each support.
- F. Provide a minimum of 12 inches headroom above all types of cable supports.
- G. Provide a minimum of 3 inches clear vertical space above ceiling system at cable lowest point.
- H. Provide cable support within 18 inches of each transition of pathway system types. This includes transitioning from any one to any other of the following cable support systems such as raceway, sleeves, chases, or J-hooks.
- I. Set J-hooks so that changes in direction do not exceed 45 degrees.

END OF SECTION

STRUCTURED CABLING

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Requirements for the design and installation of a complete and functional telecommunications cabling system including communications cable, equipment racks, patch panels, telecommunications jacks, raceways, and other equipment or components as required to achieve the specified function.

1.03 RELATED SECTIONS

- A. Section 26 05 29 – Hangers and Supports for Electrical Systems.
- B. Section 26 05 33 – Raceway and Boxes for Electrical Systems.
- C. Section 26 05 53 – Identification for Electrical Systems.
- D. Section 27 05 28 – Pathways for Communications Systems.

1.04 PROJECT RECORD DOCUMENTS

- A. Submit documents under the provisions of Division 1.
- B. Accurately record location of jacks, pull boxes and equipment racks, routing of all telecommunications raceways and cables, numbering scheme and identification number of all cables and jacks.
- C. Submit test results for all cables prior to Substantial Completion.

1.05 LISTINGS AND STANDARDS

- A. Furnish products listed and classified by Underwriters Laboratories, Inc. and suitable for purpose specified and indicated.
- B. Where a UL Standard is in effect equipment shall meet that standard and shall bear the UL label.

1.06 REFERENCE CODES AND STANDARDS

- A. The publications listed below form a part of the specification to the extent referenced. The publications are referred to in the text by basic designation only. The reference codes and standards are minimum requirements:
 - 1. ANSI/NFPA 70 National Electrical Code, latest adopted version.
 - 2. BICSI Telecommunications Distributions Methods Manual, current version.
 - 3. ANSI/TIA 568-C Commercial Building Telecommunications Cable Standard, current version.
 - 4. ANSI/TIA 569-C Commercial Building Standard for Telecommunications Pathways and Spaces, current version.
 - 5. ANSI/TIA 606-A Administration Standards for the Telecommunications Infrastructure of Commercial Buildings, current version.
 - 6. J-STD-607-A Commercial Building Grounding and Bonding Requirements for Telecommunications, current version.

1.07 QUALITY ASSURANCE

- A. Install all work in accordance with the above reference standards and codes. The Owner reserves the right to reject all or a portion of the work performed either on technical or aesthetic grounds.
- B. All workmen employed for installation of equipment and cabling specified under this section shall be specifically trained and certified in the installation of the specified Category 6 UTP cabling systems, and shall have at least three years of experience installing, terminating, and testing Category 6 UTP on this size and complexity of project.
- C. The intended function of the telecommunications cable system is to transmit voice and data signals from a central location to individual telecommunications outlet locations. Upon completion of the work, the UTP cable system shall be capable of transmitting a data signal that meets and exceeds the following requirements:
 - 1. Category 6: Supports data rates up to and including 1 Gb/s.

1.08 SUBMITTALS

- A. Submit product data under provisions of Division 1. Provide factory test results for cables and connectors. Provide product data for the following products:
 - 1. UTP Telecommunications Cable.
 - 2. UTP Telecommunications Jacks and Faceplates.
 - 3. UTP Patch Cables.
 - 4. UTP Telecommunications Cable Tester.
 - 5. UTP Sample Test Report (with all required testing parameters shown).

- B. Submit qualifications and certifications to install the specified cabling system.

1.09 LABELING SYSTEM

- A. Labeling shall conform to ANSI/TIA-606-B standards, Section 26 05 53, and this Section.
- B. Telecommunications Outlets:
 - 1. Labels on all outlets shall have minimum 1/8-in. high characters and shall be installed behind recessed clear plastic covers on faceplate.
 - 2. Label room outlets with two labels on the faceplate as follows:
 - a. Top Label: Shows the telecommunication room the cable is run to (MDF, TC2, TC3, etc), followed by rack number (1, 2, etc.) followed by patch panel identification expressed as a letter (A), followed by port in patch panel the outlet is located (xx). Example: TC2-2B:38 (where TC2 indicates closet, 2 is the second rack, B is the second patch panel in the rack, 38 is the port in patch panel).
 - b. Bottom Label: Shows the room number (room 103), followed by the jack/outlet number (J2) from the left when entering the room, followed by the quantity of ports within the outlet faceplate (1-6). Example: 103 J2:1 (where 103 is the room number, J2 is the 2nd jack/outlet from the left in the room, and 1 is the single port in the faceplate). Where the faceplate has multiple ports, the last part of the ID shall indicate the quantity. Example: 103 J2:1-4 (where 103 is the room number, J2 is the 2nd jack/outlet from the left in the room, and 1-4 represents the four ports in the faceplate).
- C. Copper Horizontal Cable:
 - 1. Label the end of each cable with the same designation used on the equipment where the cable is terminated (i.e. the patch panel or telecommunications outlet). Labels shall be installed within one inch of the end of the cable insulation, after the insulation has been cut back to allow for termination.

1.10 PROJECT RECORD DRAWINGS

- A. Submit documents under the provisions of Division 1. Provide drawings in printed, PDF, and CAD formats.
- B. Update the approved shop drawings to produce record drawings that include all changes made during the construction process, as well as all final jack ID numbers.
- C. Turn these drawings over to the Owner's Representative two (2) weeks prior to substantial completion, to allow the Owner's Personnel to connect and test Owner-provided equipment in a timely fashion.

PART 2. PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS – STRUCTURED CABLING SYSTEM

- A. Throughout this specification, specific manufacturers and manufacturer's catalog numbers are cited. These citations are for the purpose of establishing quality and performance criteria and are not intended to be proprietary. All products in the structured cabling system

shall be provided from one of the approved manufacturing partnerships listed below, or an alternate system shall be substituted under the provisions of Division 1.

1. Ortronics/Superior Essex.
2. Belden.
3. Hubbell/Mohawk.
4. TE Connectivity (formerly ADC/Krone/Amp).
5. CommScope Uniprise.
6. Leviton/Berk-Tek.
7. Substitutions: Under provisions of Division 1.

- B. Structured Category 6 cabling systems shall include, but not be limited to, UTP telecommunications cable, UTP jacks, faceplates, and UTP patch cables.

2.02 UTP TELECOMMUNICATIONS CABLE

- A. All Horizontal UTP telecommunications cables that stay within the building envelope shall be UL listed, plenum-rated CL2P, Category 6 (except as noted below), 4 pair, 23-24 AWG, solid copper conductor, blue jacket.

1. Superior Essex "DataGAIN" CMP or approved equal.
2. IP Video System: Provide green jacket.

- B. All UTP telecommunications cables that exit the building envelope shall be UL listed, outside plant rated, Category 6, 4 pair, 23-24 AWG, solid copper conductor cable, injected with water-resistant flooding compound and jacketed with UV-resistant polyethylene jacket.

1. Superior Essex "OSP Cat 6" or approved equal.

2.03 UTP TELECOMMUNICATIONS JACKS

- A. All UTP telecommunications jacks shall be Category 6, T568A/B, 8P8C, single, white finish, telecommunications jack with flush exit. Unless otherwise noted on the drawings, install each telecommunications jack in a single gang faceplate at each telecommunications outlet. The quantity of faceplate openings shall match the quantity of jacks at each location. All jacks shall be wired using the T568B wiring configuration.

- B. UTP Jacks:

1. Ortronics "TracJack Clarity 6" #OR-TJ600 or approved equal.

2.04 TELECOMMUNICATIONS OUTLET FACEPLATES

- A. Unless otherwise noted, all faceplates shall be single-gang plastic faceplates with white finish. The number of openings in each faceplate shall match the jack count of each outlet shown on the Drawings. (x in part numbers = designation for number of openings in faceplate)

1. Ortronics "TracJack" #OR-4030054x or approved equal.

2.05 UTP PATCH CABLES

- A. All patch cables shall be factory manufactured to match the applicable cable/connectivity solution (i.e. the Ortronics/Superior Essex system shall use Ortronics manufactured patch cords, etc.).
- B. Network Equipment Connections: Provide Category 6 patch cables with blue jacket for installation between network equipment in the rack and dedicated data ports in the telecommunications patch panels. Provide one patch cable for each port in all the telecommunications patch panels. Where the patch panels and switches are in the same rack, provide 7' cables. Where the patch panels and switches are in different racks, provide 15' cables. (xx in part numbers = cable length)
 - 1. Ortronics #OR-MC6xx-06 or approved equal.

2.06 CABLE SUPPORT

- A. All cables not installed in conduit shall be supported in accordance with Section 27 05 28.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work.

3.02 GENERAL INSTALLATION

- A. Follow cable manufacturer's specification regarding handling methods, retaining/support methods, bending radius and maximum pulling tension limitations. Where manufacturer does not provide bending radius information, minimum bending radius shall be 10 times the diameter of the cable. Use a tension-monitoring device to ensure that the maximum pulling tension that may be applied to the cable to be pulled into a conduit section is not exceeded. Provide replacement cable if cable manufacturer's maximum pulling tension is exceeded at any time during a pull.
- B. Cable shall be carefully inspected for sheath defects or other irregularities as it is paid out from the reel. When defects are detected, pulling shall stop immediately and the cable section shall be repaired or replaced at the discretion of the Owner. A system of communications shall be maintained between pulling and feed locations so that pulling can be stopped instantly, when required.
- C. Adequate care shall be exercised when handling and storing reels of cable to prevent damage to the cable. Cable with dents, flat spots, or other sheath distortions shall not be installed.
- D. Install termination backboards plumb and attach securely at each corner.
- E. Store a maximum of one foot of slack UTP cable for each UTP jack at each telecommunications outlet.
- F. In the telecommunications closet, ten feet of slack UTP cable shall be provided at the racks. Route the service loop around the cable runway above the racks. No cables shall encroach or interfere with rack equipment space. All cables shall be protected from physical damage and should not be routed on the floor. Coiling the slack cable adjacent to the rack is not

acceptable. The intent of this installation method is to provide slack cable for future work without causing increased inductance by coiling the cables.

- G. All cabling shall be run continuous with no splices from each telecommunications jack to the cable connector at the patch panels. Telecommunications cables shall be terminated at each end on their respective jack. No cable run shall exceed 90 meters (295 feet) in length from the jack on the peripheral end to the patch panel.
- H. All cable shall be routed in such a way as to minimize EMI and RFI interference. Cables shall be routed to maintain the following minimum distances from noise producing devices:
 - 1. Open or Nonmetallic Communications Pathways:
 - a. 12 inches from electrical equipment and power lines of 3 kVA or less.
 - b. 18 inches from fluorescent and HID ballasts.
 - c. 36 inches from electrical equipment and power lines greater than 5 kVA.
 - d. 48 inches from transformers and motors.
 - 2. Grounded Metal Conduit Communications Pathways:
 - a. 3 inches from electrical equipment and power lines of 2 kVA or less.
 - b. 6 inches from electrical equipment and power lines of 2 kVA to 5 kVA.
 - c. 12 inches from 5 kVA or greater power lines.

3.03 TERMINATIONS

- A. The jacket of UTP cables shall be maintained to a point within one inch of the telecommunications jack. The twists on the individual pairs shall be maintained as close as possible to the contacts of the termination points but shall in no case exceed 1/2 inch.
- B. Pairs from each cable shall be terminated sequentially from left to right, top to bottom starting with the lowest assigned number at the upper left-hand corner of the panel.

3.04 PATHWAYS AND RACEWAYS

- A. Unless otherwise noted, all cables shall be installed in conduit from the telecommunications jack to the space above the accessible ceiling, within 18" of the J-hook cable tray pathway. Portions of cables not installed in conduit shall be supported in accordance with ANSI/TIA standards at intervals not exceeding four (4) feet in length using J-hooks. The cable shall not be supported from ducts, pipes, conduits, ceiling grid hangar wires, etc. At any point where the cable changes direction, slack shall be provided to prevent rubbing or binding on the corner supports. Extreme care shall be taken to ensure that the cable is not compressed, kinked or otherwise deformed during installation. Any cable that is stretched, compressed, kinked or otherwise deformed shall be replaced at no cost to the Owner.
- B. Cables to be installed in raceway, cable tray, continuous cable support system or J-hooks (as specified above) for the entire length of each cable. Provide raceway through areas that will not be accessible for future cable replacement or additions.
- C. Provide pathway capacity throughout entire system for each telecommunication outlet served, sized to accommodate a minimum of four 4-pair cables from each outlet location to the designated telecommunication room, as shown on the plans. Minimum conduit size is 1". Provide equivalent minimum capacity for equivalent surface raceway.

- D. Telecommunication cables shall not be installed in the same raceway or pathway as power cables.
- E. Install polyethylene pulling string in each empty conduit containing a bend or over 10 feet in length.
- F. Install all telecommunications outlets in outlet boxes under the provisions of Section 26 05 33. Unless otherwise noted on the Drawings or in the Specifications, outlets shall be mounted at 18 inches above floor, 4 inches above counters or backsplash, with the jacks oriented in the standard "pins down" position.
- G. Support raceways, outlet boxes, junction boxes and equipment racks under the provisions of Section 26 05 29.

3.05 LABELING

- A. Label equipment racks as noted here-in and under the provisions of Section 26 05 53.
- B. Furnish and install labels and documentation to identify all cables, jacks, and connections in accordance with ANSI/TIA standards, as shown on the Drawings, and under the provisions of Section 26 05 53. As a minimum each jack in each faceplate shall have a unique identifier that matches the identifier at the patch panel. Identifiers shall be installed on the front of the telecommunications faceplate, on the cable behind the faceplate, and on the front of the patch panel at the associated jack.

3.06 CABLE ACCEPTANCE TESTING

- A. Each UTP cable shall be tested for compliance with ANSI/TIA 568C Category 6 standards after installation using a Fluke DSX Series or approved equal tester that has been factory calibrated within the last year. At a minimum, the Contractor shall perform the following tests with the maximum frequency of the tester set at 350MHZ:
 - 1. Signal Attenuation / Insertion Loss.
 - 2. Near End Cross Talk (NEXT).
 - 3. Power Sum Near End Cross Talk (PS-NEXT).
 - 4. Attenuation to Crosstalk Ratio – Near End (ACR-N)
 - 5. Attenuation to Crosstalk Ratio – Far End (ACR-F).
 - 6. Power Sum Attenuation to Crosstalk Ratio – Near End (PSACR-N).
 - 7. Power Sum Attenuation to Crosstalk Ratio – Far End (PSACR-F).
 - 8. Propagation Delay.
 - 9. Delay Skew.
 - 10. Return Loss.
 - 11. Wiremap.
 - 12. Overall Cable Length.
- B. Test, analyze, and record compliance for the following network protocols:
 - 1. 10 Base-T.
 - 2. 100 Base-T.
 - 3. 1000 Base-T (1 Gb/s).
- C. The Contractor shall provide 100% testing for each "permanent link" (i.e. from the work area outlet to the patch panel). Provide test results for all tests noted above in the form of printouts from the test equipment and provide an electronic copy of the test data for each

cable on CD. If proprietary software is used, the submitted CD shall include any necessary software required to view test results. If the results are delivered in a standard format such as Excel or Access, the viewing software need not be provided. At the front of the test report, the Contractor shall provide an index showing the pass/fail results of each cable, along with the cable length and a corresponding cable label.

- D. Where any portion of the system does not meet the Specifications, the Contractor shall correct the deviation and repeat any applicable testing at no additional cost to the Owner.
- E. Provide three working days advance notice of tests. The Owner's Representative shall reserve the right to be present during the testing of any or all cables in the system. Submit a copy of the test report for each cable prior to substantial completion of the project.
- F. Acceptance of the telecommunications system shall be based on the results of the above tests, functionality, and the receipt of documentation.

END OF SECTION

VIDEO SURVEILLANCE SYSTEM

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- B. Notification of Child Occupied Facility: Portions of this building are classified as a Child Occupied Facility in accordance with 40 CFR 745 and lead-based paints may be present on components to be disturbed in those areas. Personnel performing work in these areas must comply with the requirements of 40 CFR 745, including training, work practices and cleaning of the work area. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of lead materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 SECTION INCLUDES

- A. Video Management Software.
- B. Fixed Cameras.
- C. PoE Network Switch.
- D. Video Cable.
- E. UTP Components.

1.03 RELATED SECTIONS

- A. Section 26 05 33 – Raceway and Boxes for Electrical Systems.
- B. Section 26 05 53 – Identification for Electrical Systems.
- C. Section 27 05 28 – Pathways for Communication Systems.
- D. Section 27 10 00 – Structured Cabling.

1.04 REFERENCE CODES AND STANDARDS

- A. The publications listed below form a part of the specification to the extent referenced. The publications are referred to in the text by basic designation only, latest edition. The reference codes and standards are minimum requirements:

1. ANSI/NFPA 70 National Electrical Code, latest adopted edition.
2. BICSI Telecommunications Distributions Methods Manual.
3. TIA/EIA 568-B.1 Commercial Building Telecommunications Cable Standard, Part 1: General Cabling System Requirements (including Addendums).
4. TIA/EIA 568-B.2 Commercial Building Telecommunications Cable Standard, Part 2: Balanced Twisted-Pair Cabling Components (including Addendums).
5. TIA/EIA 569-A Commercial Building Standard for Telecommunications Pathways and Spaces
6. TIA/EIA 606 Administration Standards for the Telecommunications Infrastructure of Commercial Buildings.

1.05 SUMMARY OF WORK

- A. Provide new IP cameras were indicated and add to existing system. Note that shop drawings will be required for these schools. All other tasks as applicable shall be performed as noted in table below.
- B. The VMS software and all related integration and programming shall be provided and installed by a Systems Integrator (Siemens) assigned to the project. The delineation of work between the ASD Integrator and Contractor is as follows:

Task	Integrator	Contractor
Provide all VMS software and licenses	X	
Install and configure VMS software on Owner-Furnished server. Set up site on central management server. Create map for site and populate camera locations.	X	
Install server in telecom rack	X	
Install and configure VMS software on Owner-Furnished client workstation	X	
Install client workstations where specified on the Drawings	X	
Install Owner-Furnished network switches in telecom racks	X	
Prepare product data submittals and shop drawings for all equipment, including cameras.		X
Purchase all cameras and other equipment. Turn over cameras to Integrator for configuration.		X
Configure all cameras; assign IP addresses, bench-test cameras for proper operation. Return equipment to Contractor for installation. See sections 'G' and 'H' below for additional work included in this task.	X	
Demolish any existing cameras and equipment to be removed, where specified on the Drawings		X
Provide and install all cabling for cameras, power supplies, monitors, and other field devices and equipment. Terminate and test all cabling.		X
Install new cameras, power supplies, and other equipment where specified on the shop drawings.		X
Provide and install new receptacle and telecom outlets for monitors or networking equipment, where indicated on the Drawings		X
Aim and focus all cameras		X
System initial startup and testing (e.g. confirming basic operation).		X

System final testing and commissioning (e.g. confirming full functionality and integration).	X	
System demonstration and training	X	
Perform all other work as specified in the Contract Documents.		X

- C. Where indicated in this specification, some components are Owner-furnished and ASD Integrator-installed. Coordination with ASD and the ASD Integrator throughout the construction process is critical to the success of this project.
- D. The ASD Integrator may act as a supplier to the Contractor but may not act as either the general contractor or a sub-contractor for the camera installation contract. At the contractor's option, the ASD Integrator is allowed to create shop drawings if acting in the role of a supplier.
- E. All new equipment and assemblies shall be Underwriters Laboratories approved if applicable.
- F. Remote Access: The system shall have provision for secure remote access via a VPN. This shall enable either the Owner or the Security Systems Integrator to access the system remotely for troubleshooting or maintenance. The VPN settings will be provided by the Owner.
- G. New IP Camera Configuration Scope of Work (Pre-Installation)
1. Assign via utility ASD-provided IP address, subnet and gateway into each camera.
 2. Make IP address label and affix to each camera.
 3. Provide installation location on box for installation contractor.
- H. Video Management System (VMS) Camera Set Up Scope of Work (Post Installation)
1. Run VMS Wizard to enroll cameras.
 2. Enroll and label cameras into specific recorder.
 3. Identify cameras into specific group parameters.
 4. Create naming convention for each specific camera IP address.
 5. Configure the following parameters for each camera based on actual installed field of view via VMS programming interface:
 - a. Live and recorded bit rate settings.
 - b. Frames per second
 - c. Motion sensitivity
 - d. Quality settings
 - e. Compression method
 - f. Pre – post alarm buffer options
 - g. Schedule recording & archiving
 - h. Assign permissions per cameras
 6. Configure the following parameters based on the actual installed camera field of view for each camera via the camera manufacturer's installation utility:
 - a. White balance
 - b. Zoom / Focus
 - c. Aspect ratio 16:9 HD or 4:3 megapixel
 - d. Color correction

- e. Day night settings
- f. E-flip if necessary
- g. Synchronize cameras to clock
- h. Any manufacture specific cameras setting such as "LightFinder" or "ViewDR," and "XDNR."

1.06 QUALIFICATIONS

- A. Technical Support: All new components shall be provided with the availability of a toll-free 24-hour technical support phone number from the manufacturer. The phone number shall allow for immediate technical assistance for either the dealer/installer or the end user at no charge.
- B. All video cabling system layout and installation shall be overseen by a BICSI-certified Registered Communications Distribution Designer (RCDD). The installer shall either have an RCDD on permanent staff or shall have an RCDD on contract for the duration of the project. The RCDD shall sign and attest to all cable distribution design submittals and project record drawings and shall attest to the completeness and accuracy of the system layout and installation.
- C. All workmen employed for installation of telecommunications equipment and cabling specified under this section shall be specifically trained and certified in the installation of the specified Category 6 UTP cabling systems, and shall have at least three years of experience installing, terminating, and testing Category 6 UTP on this size and complexity of project.
- D. Video System Equipment Manufacturers: Companies specializing in the specified equipment with a minimum of three years documented experience.
- E. Video System Equipment Suppliers: Companies specializing in supplying the products specified in this Division with minimum three years documented experience and authorized by product manufacturers.
- F. All components shall be provided with an explicit manufacturer warranty.

1.07 SUBMITTALS

- A. Shop Drawings: Submit under provisions of Division 1 and Section 26 05 00. All video surveillance system shop drawings must be approved by ASD prior to start of work. Electronic AutoCAD® drawings of the facility are available upon request for preparation of the shop drawings. Provide contract-size shop drawings that include the following information:
 - 1. One-line diagrams for the video system that show the signal relationships of all devices within the system.
 - 2. Floor plan drawings showing the locations of all cameras, along with camera name, camera type and mounting (i.e. wall or ceiling), lens selection, conduit routing, and telecom closet/rack assignment.
 - 3. Floor plan drawings shall show entire cable pathway, including existing sections of pathway (i.e. cable tray) that are used for the video system. Show sizes of all conduit sleeves along the pathway.
 - 4. Indicate electrical characteristics and connection requirements, including line voltage and low voltage wiring, and logic diagrams or block diagrams where required.

5. Show scaled, pictorial layout drawings of the new video head-end equipment, including rack elevations and wire/cable designations as shown on the one-line diagrams or elsewhere in the shop drawings.
6. Drawings shall be done in a scale that allows the smallest text on the drawing to be legible when the drawing is reduced to 11" x 17".

- B. Product Data: Provide data for each component specified, showing electrical characteristics and connection requirements.
- C. Calculations: Coordinate product data information with the ASD Integrator, who will provide bandwidth and storage calculations for all cameras, based on the parameters specified in this section. These calculations will be used by ASD to order all servers, workstations, and network switches, so that the overall system will perform as expected.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site, store and protect under provisions of Division 1.
- B. Store products in clean, dry area; maintain temperature to NEMA ICS 1.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. Maintain area free of dirt and dust during and after installation of products. Protect other surfaces against damage and discoloration caused by work of this section.

1.10 COORDINATION

- A. Coordinate work under provisions of Division 1.
- B. IP Addresses: Acquired by the ASD Integrator.
- C. Coordinate all camera locations with the ASD Project Manager prior to rough-in and avoid conflicts with existing equipment and objects that may obstruct the field of view or, in the case of light fixtures, may affect the camera performance and quality of the video image.
- D. Coordinate all camera outlet box, J-hook, conduit, and cable tray locations to avoid conflicts with mechanical piping and ductwork, structural members, and other materials above the accessible ceilings and along the entire cable pathway.
- E. Any camera that is located so that camera performance or field of view is adversely affected shall be relocated by the Contractor at no additional cost to the Owner.
- F. Continuity of Service:
 1. Take no action that will interfere with, or interrupt, any existing building services unless previous arrangements have been made with the Owner. If system shutdown is required arrange the work to minimize shutdown time.
 2. Owner's personnel will perform shutdown of operating systems. The contractor shall give three (3) days advance notice for systems shutdown.
- G. Should services be inadvertently interrupted, immediately furnish labor, including overtime, material, and equipment necessary for prompt restoration of interrupted service.

1.11 SYSTEM DEMONSTRATION AND ACCEPTANCE

- A. Provide systems demonstration under provisions of Division 1 and Division 26.
- B. At the time of the Substantial Completion Inspection, the Contractor and ASD Integrator shall be on-site to demonstrate the operation of the video surveillance system to the Owner's Representatives and Engineer. All system components shall be installed and fully operational at the time of the demonstration.
- C. The Engineer shall review the demonstration with the Owner's Representatives and provide the Contractor with a list of modifications and/or adjustments deemed appropriate for the proper operation of the system. The Contractor shall make all modifications prior to final completion and at no additional cost to the Owner.
- D. System demonstration shall be conducted as directed by the Owner and Engineer but generally described as follows:
 - 1. Call up each camera on the local workstation(s), using the VMS client software.
 - 2. Call up each camera on a remote laptop or workstation, using the browser interface of the VMS software.
 - 3. By the ASD Integrator: Demonstrate search and review of video segments using both the keyboard controller and the remote viewing software.
 - 4. By the ASD Integrator: Demonstrate search and review of video segments using the VMS software. Download a selected video segment to a DVD or flash drive and demonstrate that it can be viewed on another computer.
- E. After all changes have been made to the system, the ASD Integrator shall provide the Owner's authorized personnel with operation and maintenance training for the video surveillance system, as specified in this section.

1.12 SYSTEM TRAINING

- A. Training shall be provided by the ASD Integrator, as defined under that contract.
- B. The Contractor shall have approved operation and maintenance manuals, parts lists, and project record drawings for all equipment on hand at time of instruction. Coordinate with the ASD Project Manager and ASD Integrator for schedule requirements.

1.13 PROJECT RECORD DRAWINGS

- A. Submit documents under provisions of Division 1.
- B. Accurately indicate actual locations of all cameras, switches, servers, etc.
- C. Show the actual installed cable pathway route, including type and size of pathway.
- D. Include a reduced set (11" x 17") set of the video surveillance system project record drawings in the operation and maintenance manual.

1.14 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Division 1.
- B. Document ratings of system and of each major component.

- C. Include instructions for starting, re-starting, and operating the computers and network switches.
- D. Identify operating limits, which may result in hazardous or unsafe conditions, or in equipment damage.
- E. Include routine preventive maintenance schedule.
- F. List special tools, maintenance materials, and replacement parts.
- G. Include repair instructions for procedures to check, repair, and test equipment during typical malfunctions.
- H. For all components provided by ASD and installed by the ASD Integrator, coordinate with the ASD Integrator for the necessary documentation to be included in the O&M manual.
- I. Include a printed "cheat sheet" for operation of the VMS, as provided by the ASD Integrator. Provide a printed sheet in the O&M Manual a laminated sheet for use at each client workstation.

1.15 EXTRA MATERIALS

- A. Provide the following spare parts for the video surveillance system, under the provisions of Division 1.
 - 1. Provide two keys of each type for all lockable enclosures and other lockable equipment.
 - 2. Provide two (2) backup copies on flash drive of the configuration settings for all network switches and the video storage appliance, as prepared and provided by the ASD Integrator.

1.16 WARRANTY

- A. Warranty all materials, installation and workmanship for one (1) year from date of acceptance.
- B. Copies of manufacturer product warranties for all equipment shall be included in the operation and installation manuals.

PART 2. PRODUCTS

2.01 PRODUCT SPECIFICATIONS

- A. Throughout this specification, specific manufacturers and manufacturer's catalog numbers are cited. Unless otherwise noted, these citations are for the purpose of establishing quality and performance criteria and are not intended to be proprietary. All decisions regarding approval of non-specified manufacturers and products will be at the discretion of the Owner.
- B. Where no manufacturer is specified, provide products of manufacturers in compliance with requirements. Any item of equipment or material not specifically addressed on the drawings or in this document and required to provide a complete installation shall be provided in a level of quality consistent with other specified items.

- C. The Contractor shall provide the latest product model and software version available from each manufacturer at the time of installation. No "beta version" or "test software" products will be accepted. The Contractor shall verify that the hardware provided, including all cameras, has the most recent firmware installed. All proposed and provided equipment and products shall be from the specified and approved manufacturers only, unless previously approved by the Engineer or Owner.
- D. All products and materials are to be new and free of defects, damage and corrosion. All materials shall be in compliance to all applicable codes and designed specifically for the function intended.
- E. Quantity and location of all devices and equipment shall be as specified in Contract Documents or as required for a complete and operable system.
- F. The Owner reserves the right to request a sample camera within (5) business days and a reference for an installation within the State of Alaska utilizing any proposed substitute camera manufacturer.

2.02 VIDEO MANAGEMENT SYSTEM (VMS) SOFTWARE

- A. Existing.

2.03 GENERAL CAMERA HARDWARE AND MOUNTS

- A. Mounting: Provide mounting arm were indicated on the Drawings.
 - 1. Wall-Mount: Axis #T91A61 or approved equal mounting arm (arm to match camera provided).
- B. Anchoring:
 - 1. Anchoring shall be rated for the load and mounting surface.
 - 2. All anchoring sets shall be installed per manufacturers' instructions and be appropriate for the surface to which they are mounted.
 - 3. All manufacturers' torque specifications shall be adhered to as applicable and be appropriate for the surface to which the anchoring sets are mounted.
 - 4. Mounts shall be rated for the weight, external weight (i.e., snow or rain), twist, and wind loading of the equipment used.
 - 5. All hardware shall be installed so that it cannot be removed without the use of hand tools.
 - 6. Exterior Cameras: All fasteners used to secure camera wall brackets shall be tamperproof, such as Torx or center-pin allen screws.

2.04 PoE NETWORK SWITCH

- A. PoE Switch: Most locations shall utilize existing PoE Network Switches. Where new switches are required, they shall be provided by ASD and configured and installed by the ASD Integrator.

2.05 UTP CABLE AND COMPONENTS

- A. Per Section 27 10 00.

PART 3. EXECUTION

3.01 GENERAL INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide cable pathway system under provisions of Sections 26 05 33.
- C. Provide boxes for mounting devices, cable pulling, and splicing cables under provisions of Section 26 05 33.
- D. Cabling Installation: Per Specification Section 27 10 00.
- E. Exterior Cameras: Video cables shall be installed in conduit from the exterior camera to the outlet box with the UTP jack. The outlet box shall be located within the building envelope and as close as possible to the camera, while still being readily accessible. For exterior cameras mounted on parapet arms, provide ductseal in the top of the camera housing where it attaches to the parapet arm. The intent is to prevent condensation in the dome housing.
- F. Monitor Mounting and Connections:
 - 1. Wall-Mounted Monitors: Secure wall bracket to structural component of wall. The use of drywall anchors or other non-structural supports is not acceptable. If necessary, provide a wood or metal backing plate that spans the width of two studs and paint backing plate to match surrounding wall surface. Provide new receptacle and HDMI wall plate behind monitor. Where monitors are installed on CMU walls, install receptacle and HDMI wall plate using surface raceway. Otherwise, install receptacle and HDMI wall plate using cut-in boxes and flex conduit to above the accessible ceiling.
 - 2. Connect receptacle to nearest available circuit with capacity and connect HDMI wall plate to designated Client Workstation Computer.

3.02 VIDEO SURVEILLANCE SYSTEM BACK-CHECK

- A. Ninety days after Substantial Completion, the Contractor shall meet at each school with the Owner's Representatives to make any adjustments to the operation of the video surveillance system. This may include, but is not limited to the following:
 - 1. Adjusting the aiming point and/or field of view for any of the installed fixed cameras.

END OF SECTION

