



Anchorage School District

GRUENING MIDDLE SCHOOL BOILER ROOM IMPROVEMENTS

**ITB 2025-808
ASD PROJECT No. 730017**

DATE ISSUED: February 28, 2025

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INVITATION TO BID (ITB) NUMBER: 2025 - 808
Gruening Middle School Boiler Room Improvements

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 Gruening Middle School Boiler Room Improvements 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 6, 2025 at 4:30 p.m. Local Time
Pre-Bid Conference:	March 7, 2025 at 1:00 p.m. Local Time
Bid Opening:	March 21, 2025 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/2025/808.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.

STUDENT COMMUNITY WORKFORCE AGREEMENT

This project is subject to the Student Community Workforce Agreement per ASD Board Policy 3311.2. The awarded Contractor must review, understand and agree to Attachment A, Community Workforce Agreement, which will be incorporated into the contract.

ON-SITE VISIT AND PRE-BID CONFERENCE:

An On-Site Visit will be held on March 6, 2025 at 4:30 p.m. Local Time at Gruening Middle School, 9601 Lee Street, Eagle River, Alaska 99577. Please meet at the Front Office.

A Pre-Bid Conference will be held March 7, 2025 at 1:00 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 Visit 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 reasonable accommodations 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 projects will be conducted every 30 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.

INSTRUCTIONS TO BIDDERS

Division 0

Section 00100

- 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 6, 2025
Pre-Bid Conference	March 7, 2025
Bid Opening	March 21, 2025
Board Meeting (anticipated).....	April 8, 2025, Non-Action, April 22, 2025, Action
Notice to Proceed (anticipated).....	April 29, 2025
Site Available to Contractor	May 22, 2025
Substantial Completion – Building.....	August 14, 2025
Final Completion	September 26, 2025

Dates of Interest:

School Ends for Students.....	May 21, 2025
Teachers Last Day.....	May 22, 2025
Memorial Day Holiday	May 26, 2025
Juneteenth Holiday	June 19, 2025
Independence Day Holiday	July 4, 2025
Teachers First Day	August 11, 2025
Students First Day	August 14, 2025
Labor Day	September 1, 2025
Indigenous Peoples Day	October 13, 2025
Parent Teacher Conferences.....	October 22 – 23, 2025
Thanksgiving Holiday	November 27 – 28, 2025
Winter Vacation	December 22, 2025 – January 2, 2026
Martin Luther King Holiday	January 19, 2026
Presidents Day Holiday.....	February 16, 2026
Spring Break Week.....	March 9 – 13, 2026
School Ends for Students.....	May 20, 2026
Teachers Last Day.....	May 21, 2026
Memorial Day Holiday.....	May 25, 2026
Juneteenth Holiday	June 19, 2026

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: Gruening MS Boiler Room Improvements

Invitation to Bid Number: 2025 – 808

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. None

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. None

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, exceeding \$100,000, ASD will audit the prime contractor at 30-day intervals. 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 in excess of \$100,000 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 exceeding \$100,000 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. 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.
- H. 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.
- I. 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.
- J. 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 exceeding \$100, 000. Each 30-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 (if applicable)

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.

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:	\$xxx,xxx.xx
Additive Alternate 1:	\$xxx,xxx.xx
Siemens Allowance:	\$xxx,xxx.xx
Total:	\$xxx,xxx.xx

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.

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: _____

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.

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
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- 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

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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.	
APPROVED FOR PAYMENT _____ Date	
_____ (Signature of Architect)	
_____ Date	
_____ (ASD Project Manager)	

ASD 100 (1/15)

[illegible]

ASD# 100B (1/15) Continuation
Sch. of Values/
Work Completed

Page 1
of Detail Schedule

ANCHORAGE SCHOOL DISTRICT APPLICATION FOR PAYMENT Schedule of Stored Materials			
Project Name: ITB/RFP No. : Name of Contractor:	INVOICE #	VENDOR	DESCRIPTION
Contract #.: Application #: Application date: Period to :			AMOUNT STORED AT END OF THIS PERIOD
			TOTAL STORED MATERIALS \$ -

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: _____.

ASD Form 103

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

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 LIABILITY INSURANCE		DATE (MM/DD/YYYY)
PRODUCER		THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.
INSURED		
		INSURERS AFFORDING COVERAGE
		NAIC #
		INSURER A: INSURER B: INSURER C: INSURER D: INSURER E:
COVERAGES		
THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.		
INSR ADD'L LTR INSRD	TYPE OF INSURANCE	POLICY NUMBER
	GENERAL LIABILITY ☐ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS MADE ☐ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PRO-JECT ☐ LOC	POLICY EFFECTIVE DATE (MM/DD/YYYY)
	AUTOMOBILE LIABILITY ☐ ANY AUTO ☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS ☐ HIRED AUTOS ☐ NON-OWNED AUTOS	POLICY EXPIRATION DATE (MM/DD/YYYY)
	GARAGE LIABILITY ☐ ANY AUTO	LIMITS
	EXCESS / UMBRELLA LIABILITY ☐ OCCUR ☐ CLAIMS MADE ☐ DEDUCTIBLE ☐ RETENTION \$	EACH OCCURRENCE \$ DAMAGE TO RENTED PREMISES (Ea occurrence) \$ MED EXP (Any one person) \$ PERSONAL & ADV INJURY \$ GENERAL AGGREGATE \$ PRODUCTS - COMP/OP AGG \$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under SPECIAL PROVISIONS below	COMBINED SINGLE LIMIT (Ea accident) \$ BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ AUTO ONLY - EA ACCIDENT \$ OTHER THAN AUTO ONLY: EA ACC \$ AGG \$ EACH OCCURRENCE \$ AGGREGATE \$ \$ \$ \$
	OTHER	WC STATU-TORY LIMITS OTH-ER E.L. EACH ACCIDENT \$ E.L. DISEASE - EA EMPLOYEE \$ E.L. DISEASE - POLICY LIMIT \$
DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS		
CERTIFICATE HOLDER		CANCELLATION
		SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL _____ DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES. AUTHORIZED REPRESENTATIVE

ACORD 25 (2009/01)

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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.

Anchorage School District

Facilities Maintenance
1301 Labar Street
Anchorage, Alaska 99515

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

REQUEST FOR INFORMATION

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:

Date:

Request for Proposal #

Project Manager



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

Capital Planning & Construction

page 1 of 1

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 Labar 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:	
		MAX _____ MIN _____	
CLASS C	Weather occurred during this shift that caused a partial stoppage of work.	PRECIPITATION:	
CLASS D	Weather overhead excellent or suitable during shift. Work completely stopped due to results of previous adverse weather.		
CLASS E	Weather overhead excellent or suitable during shift but work partially stopped due to previous adverse manner.		
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. _____ CONTRACTOR'S APPROVED AUTHORIZED REPRESENTATIVE

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? ☐ Yes ☐ 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 Amount: _____ Check Number: _____ Cash _____ Received By: _____ Date: _____ Credit Card Confirmation _____ Visa _____ MC _____ Project Name _____ DOLWD Project # _____	
For Dept. Use Only Accepted: 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:

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

DEPARTMENT USE ONLY

- ☐ *The above applicant is current on all taxes, penalties and interest due and is in good standing with the Alaska Department of Revenue.*
- ☐ *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.*

Department of Revenue Representative

Date

*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

Submittal Control Form

Project Title: _____

Project No: _____
Contract No: _____

Contractor: _____

Submittal No. _____

Address: _____

Contact: _____

Telephone: _____

Fax: _____

New Submittal

Resubmittal

Submittal is as Specified?	Yes	No
2. Revision Number:	_____	_____
3. Submittal Control No.:	_____	_____
4. Description:	_____	_____
5. Spec. Section/Dwg Ref.:	_____	_____
Number of Copies:	_____	_____

Remarks:

Review is for general design or arrangement only. Not for quality, dimension or fit.

Submitted By _____

Date _____

Forwarded for Design Review: _____

Date

ASD Reviewed / Forwarded By _____

Review Stamp

**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

Program Number	Program Name	Program Status	Address	Occupation Title
AK00090003	ARC of Alaska, Inc.	Registered	301 Arctic Slope Avenue, Suite 100 Anchorage AK 99518	CARPENTER
AK00033002	ALASKA ACOUSTICAL	Registered	903 Mission Street EFTCHIAN AK 99001	CARPENTER
AK00055002	Alaska Carpenters Training Trust	Registered	8751 8th Street Anchorage AK 99515	CARPENTER
AK00010818	Alaska Carpenters Training Trust	Suspended	1151 W. Nugent Avenue Wasilla AK 99564	CARPENTER
AK000125887	Collins Construction, Incorporated	Registered	P.O. Box 521791 Big Lake AK 99652	CARPENTER
AK000178017	H Construction, LLC	Registered	15581 Teelling Circle Palmer AK 99645	CARPENTER
AK0001070010	ICE SERVICES, INCORPORATED	Registered	2606 C STREET, SUITE 28 ANCHORAGE AK 99508	CARPENTER
AK000081120	Woodright Construction, Inc.	Registered	P.O. Box 6235 Ketchikan AK 99901	CARPENTER
AK00033009	YUKON-KUSKOWIM DELTA APPRENTICESHIP PROGRAM	Registered	P.O. BOX 860 BETHEL AK 99509	CARPENTER
AK00055002	Alaska Carpenters Training Trust	Registered	8751 8th Street Anchorage AK 99515	CARPENTER, INTERIOR SYSTEMS (Alternate Title: Interior Systems Carpenter)
AK00055003	Alaska Carpenters Training Trust	Registered	8751 8th Avenue, Suite 10 Anchorage AK 99501	CEMENT MASON
AK000780017	Alaska Trowel Trades IATC	Registered	P.O. Box 82061 Fairbanks AK 99708	CEMENT MASON
AK00090003	ARC of Alaska, Inc.	Registered	17005 OLD GLENN HWY CHUGALUA AK 99567	CONSTRUCTION CRAFT LABORER
AK00194006	Alaska Laborers IATC	Registered	P.O. Box 1188 Petersburg AK 99833	CONSTRUCTION CRAFT LABORER
AK0017-AK-497	Rock-n-Road Construction, Inc.	Registered	P.O. Box 1188 Petersburg AK 99833	CONSTRUCTION CRAFT LABORER
AK000147693	Wolverine Supply, Inc.	Registered	5099 E. Blue Updine Drive Wasilla AK 99654	CONSTRUCTION CRAFT LABORER
AK000135904	Yakom River Towing, LLC	Registered	P.O. Box 128 Emmoak AK 99581	CONSTRUCTION CRAFT LABORER
AK000000000	ALASKA TEAMSTER-EMPLOYER SERVICE TRAINING TRUST	Registered	520 East 24th Avenue, Suite 202 Anchorage AK 99503	CONSTRUCTION DRIVER
AK0017-AK-497	Rock-n-Road Construction, Inc.	Registered	P.O. Box 1188 Petersburg AK 99833	CONSTRUCTION DRIVER
AK000103514	Holland America Princess Alaska - Yakom	Registered	988 Devers Street Fairbanks AK 99709	DIESEL MECHANIC
AK0017-AK-590	After Hours Truck & Fleet	Registered	459 Ocean Dock Road Anchorage AK 99501	DIESEL MECHANIC
AK000103514	Peak Offroad Service Company - Bristol Bay Industrial	Registered	5015 Business Park Blvd., Suite 400 Anchorage AK 99508	DIESEL MECHANIC
AK000102056	RL Trucking, LLC	Registered	1221 East 71st Avenue Anchorage AK 99518	DIESEL MECHANIC
AK0017-AK-469	907 Electric	Registered	11134 June Agnes Circle Eagle River AK 99577	ELECTRICIAN
AK00090003	ARC of Alaska, Inc.	Registered	301 Arctic Slope Avenue, Suite 100 Anchorage AK 99518	ELECTRICIAN
AK0001087586	ACE Electric, LLC	Registered	P.O. Box 1761 Seward AK 99664	ELECTRICIAN
AK000145734	Apex Electric & General Trucks, LLC	Registered	P.O. Box 7601 Nikiski AK 99657	ELECTRICIAN
AK000167701	Apex Electric	Registered	P.O. Box 7601 Nikiski AK 99657	ELECTRICIAN
AK000780015	ALASKA JOMI ELECTRICAL APPRENTICESHIP & TRAINING TRUST	Registered	5800 B STANCHORAGE AK 99518	ELECTRICIAN
AK000103514	Alaska Native Tribal Health Consortium, Division of Environmental Health & Engineering	Registered	4500 Diplomacy Drive, Suite 454 Anchorage AK 99508	ELECTRICIAN
AK000102176	Alaska's Women	Registered	39535 Fox Trail Road Soldotna AK 99669	ELECTRICIAN
AK000145920	Ala-Wa, Inc.	Registered	P.O. Box 385 Unalaksa AK 99685	ELECTRICIAN
AK000125493	Alpine Electric	Registered	13901 East Moyer Huelle Court Palmer AK 99645	ELECTRICIAN
AK000008238	ANCHOR ELECTRIC	Registered	3400 International Street Fairbanks AK 99701	ELECTRICIAN
AK000104003	Anderson Brothers Electric, LLC	Registered	5362 COMMERCIAL DRIVE JUNEAU AK 99801	ELECTRICIAN
AK0001157693	Andersn For Electric, LLC	Registered	16000 Ocean View Drive Juneau AK 99801	ELECTRICIAN
AK0017-2630	3251 Batwing Court Anchorage AK 99516	Registered	3251 Batwing Court Anchorage AK 99516	ELECTRICIAN
AK0001060013	ALIVE BAY ELECTRIC	Registered	P.O. BOX 210194 ALJKE BAY AK 99821	ELECTRICIAN
AK0001040023	BEAR ELECTRIC, INCORPORATED	Registered	2008 Perkins Drive FAIRBANKS AK 99709	ELECTRICIAN
AK0017-2428	Bering Straits Development Company	Registered	P.O. Box 1008 Nome AK 99762	ELECTRICIAN
AK000145915	Boedig Electric, LLC	Registered	P.O. Box 871301 Wasilla AK 99687	ELECTRICIAN
AK0001038401	Bridwell, Incorporated	Registered	11425 Avon Street ANCHORAGE AK 99516	ELECTRICIAN
AK000008231	Burns Electric, LLC	Registered	P.O. Box 65 Wangell AK 99929	ELECTRICIAN
AK000135727	Cable Maintenance	Registered	1295 Alone Street North Pole AK 99705	ELECTRICIAN
AK000145732	Carpenter Electric, LLC	Registered	22536 Whispering Birch Drive Chugach AK 99567	ELECTRICIAN
AK000105009	CHANNEL ELECTRIC, INC.	Registered	1155 COPPER RIDGE LANE KETCHIKAN AK 99901	ELECTRICIAN
AK000060008	CITY & BOROUGH OF SITKA, ENVIRONMENTAL DEPT.	Registered	101 LINCOLN STREET SITKA AK 99835	ELECTRICIAN
AK000168011	CNS, Inc.	Registered	1285 Overhill Drive Fairbanks AK 99709	ELECTRICIAN
AK000102862	D&S Electric, LLC	Registered	18207 Stillwater Drive Eagle River AK 99577	ELECTRICIAN
AK0002179210	Edeline Building and Supply	Registered	35775 Walker Street North Seldotna AK 99669	ELECTRICIAN
AK000168016	Excort Electric, LLC	Registered	5600 B Street Anchorage AK 99518	ELECTRICIAN
AK000147686	Evans Electric	Registered	P.O. Box 1343 Kachube AK 99732	ELECTRICIAN
AK000103517	Facility Contractors, LLC	Registered	P.O. Box 2034 Cordova AK 99826	ELECTRICIAN
AK000138004	Frontier Electrical Services, LLC	Registered	80 Vangard Drive, Suite A Anchorage AK 99507	ELECTRICIAN
AK000108993	Petco Electric, Incorporated	Registered	P.O. Box 123022 Fairbanks AK 99701	ELECTRICIAN
AK000103517	Q Construction, Inc.	Registered	P.O. Box 5440 North Anchorage AK 99705	ELECTRICIAN
AK000114003	S&S Corbin	Registered	38050 S4400 North Anchorage AK 99672	ELECTRICIAN
AK0001157096	Shaw Construction, Incorporated	Registered	P.O. Box 72109 Anchorage AK 99601	ELECTRICIAN
AK000146728	Shaw Construction, Incorporated	Registered	P.O. Box 439 Sawyer AK 99840	ELECTRICIAN
AK000091987	Shaw Creek Mining Company	Registered	P.O. Box 2	ELECTRICIAN
AK000174000	Shaw Creek Mining Company	Registered	P.O. Box 2	ELECTRICIAN
AK0017-AK-70336	Huffer Electric, Inc.	Registered	P.O. Box 2239 Soldotna AK 99669	ELECTRICIAN
AK0001070010	ICE SERVICES, INCORPORATED	Registered	2606 C STREET, SUITE 28 ANCHORAGE AK 99508	ELECTRICIAN
AK000109167	Icicle Salads, Incorporated	Registered	411 N. Nordic Drive Peavenerb AK 99833	ELECTRICIAN
AK000060009	INLET ELECTRICAL CONTRACTORS, LLC	Registered	P.O. BOX 202109 ANCHORAGE AK 99520	ELECTRICIAN
AK000158001	Integrated Communication Designs, Inc.	Registered	P.O. Box 111551 Anchorage AK 99511	ELECTRICIAN
AK000125893	Interbay Electric, Inc.	Registered	33055 Reata Lane Soldotna AK 99669	ELECTRICIAN

ANCHORAGE SCHOOL DISTRICT'S LIST OF

Program Number	Program Name	Program Status	Address	Occupation Title
AK001.03402	Intelligent Design, LLC	Registered	11741 Timberlane Drive Anchorage AK 99515	ELECTRICIAN
AK001.072022	JH ELECTRIC, INCORPORATED	Registered	P.O. BOX 3123 SOLDOTNA AK 99669	ELECTRICIAN
AK001.060015	Katavak Holdings	Registered	2000 E 88TH AVENUE ANCHORAGE AK 99507	ELECTRICIAN
AK001.135729	KO Electric, LLC	Registered	P.O. Box 3554 Homer AK 99603	ELECTRICIAN
AK001.125337	Laker Electric, Incorporated	Registered	13901 Industry Way Anchorage AK 99511	ELECTRICIAN
AK001.157988	Luxwire Electric, LLC	Registered	1534 Topon Way A Kenai AK 99611	ELECTRICIAN
AK001.135718	Maddox Electric	Registered	P.O. Box 2226 Seward AK 99664	ELECTRICIAN
AK001.135718	Maritime Electric	Suspended	P.O. Box 212602 Anchorage AK 99521	ELECTRICIAN
AK001.135718	Marathon Electric, LLC	Registered	P.O. Box 927 Seward AK 99664	ELECTRICIAN
AK001.147461	Mark IV Enterprises	Registered	951 E. Creekside Drive, #9 Wasilla AK 99554	ELECTRICIAN
AK001.147461	MAT-SU MECHANICAL, INC.	Registered	1265 EAST LONLY CIRCLE WASILLA AK 99554	ELECTRICIAN
AK001.147461	Mattlingly Electric, LLC	Registered	P.O. Box 783 Petersburg AK 99833	ELECTRICIAN
AK001.147461	MIDNIGHT SUN ELECTRIC	Registered	267 West Rockwell Avenue SOLDOTNA AK 99669	ELECTRICIAN
AK001.147461	MIDNIGHT SUN ELECTRIC	Registered	P.O. Box 56031 North Pole AK 99705	ELECTRICIAN
AK001.147461	MIRANDA ELECTRIC, INCORPORATED	Registered	7862 West Parks Highway, #189 Wasilla AK 99623	ELECTRICIAN
AK001.147461	Morax Construction	Registered	1471 West Tiplaine Drive Wasilla AK 99654	ELECTRICIAN
AK001.147461	New Hope Apprenticeship Training	Registered	806 S. Nordic Drive Petersburg AK 99833	ELECTRICIAN
AK001.147461	Nordic Electric, LLC	Registered	11210 E. Huffman Road, Suite 24, Box 695 Anchorage AK 99515	ELECTRICIAN
AK001.147461	North Wire, LLC	Registered	5015 Business Park Blvd., Suite 400 Anchorage AK 99503	ELECTRICIAN
AK001.147461	Peak Offiled Service Company - Bristol Bay Industrial	Registered	P.O. BOX 87871 WASILLA AK 99587	ELECTRICIAN
AK001.147461	PITCHER ELECTRIC, INC.	Registered	7721 School Street, Suite 1 Anchorage AK 99518	ELECTRICIAN
AK001.147461	Power & Light, Incorporated	Registered	P.O. Box 874362 Wasilla AK 99687	ELECTRICIAN
AK001.147461	Premier Electric	Registered	P.O. Box 870162 Wasilla AK 99654	ELECTRICIAN
AK001.147461	Prim Design & Construction	Registered	3808 Ben Walters Lane Homer AK 99603	ELECTRICIAN
AK001.147461	Puffin Electric, Inc.	Registered	P.O. Box 55007 North Pole AK 99705	ELECTRICIAN
AK001.147461	Ray Electric, Inc.	Registered	1698 Airport Way Fairbanks AK 99701	ELECTRICIAN
AK001.147461	Renewable Energy Systems	Registered	36784 Elmura Lake Road Chugak AK 99567	ELECTRICIAN
AK001.147461	REINER SON ELECTRIC SERVICES, LLC	Registered	6208 Mackay Street Anchorage AK 99518	ELECTRICIAN
AK001.147461	REINER SON ELECTRIC SERVICES, LLC	Registered	P.O. Box 118 Gustavus AK 99826	ELECTRICIAN
AK001.147461	Safe-T-Way Electric, Incorporated	Registered	1314 SAMMILL CREEK ROAD SITKA AK 99855	ELECTRICIAN
AK001.147461	Salmon River Electric	Registered	145 Shady Lane, #4 Soldotna AK 99669	ELECTRICIAN
AK001.147461	SALMON RIVER ELECTRIC COMPANY	Registered	39867 Driftnetter Street Kenai AK 99611	ELECTRICIAN
AK001.147461	Sourdough Specialty Contractors	Registered	9650 Mukdebail Circle Anchorage AK 99507	ELECTRICIAN
AK001.147461	Spectrum Services	Registered	2741 Enners Cutoff Road Juneau AK 99801	ELECTRICIAN
AK001.147461	Stevens Electric	Registered	6801 Hollywood Road Wasilla AK 99554	ELECTRICIAN
AK001.147461	Steve's Electrical	Registered	815 East 2nd Avenue, Suite 200 Anchorage AK 99518	ELECTRICIAN
AK001.147461	SUNMER ELECTRICAL ENTERPRISE, LLC	Registered	816 Whitney Road ANCHORAGE AK 99501	ELECTRICIAN
AK001.147461	TDC Power Services, LLC	Registered	1760 Abbott Road Anchorage AK 99507	ELECTRICIAN
AK001.147461	TGC PRO, LTD.	Registered	507 Old Stevie Highway, Suite B, PMB 402 Fairbanks AK 99701	ELECTRICIAN
AK001.147461	Teda Electric, LLC	Registered	P.O. Box 955 Craig AK 99521	ELECTRICIAN
AK001.147461	The Electrician, LLC	Registered	P.O. Box 220427 Anchorage AK 99522	ELECTRICIAN
AK001.147461	Thomas and Sons Electric	Registered	801 E. 82nd Avenue, B-14 Fairbanks AK 99518	ELECTRICIAN
AK001.147461	Trident Seafood Corporation	Registered	3230 Cord Cozy Drive Fairbanks AK 99701	ELECTRICIAN
AK001.147461	Trinity Electric, LLC	Registered	5007 W. Reliance Rd. Wasilla AK 99623	ELECTRICIAN
AK001.147461	TS Construction, Incorporated	Registered	P.O. BOX 320557 DUTCH HARBOR AK 99692	ELECTRICIAN
AK001.147461	Vanney Electric	Registered	1463 Richardson Hwy Valdez AK 99686	ELECTRICIAN
AK001.147461	WESTERN POWER ENGINEERING	Registered	1200 Quakes Circle HOMER AK 99603	ELECTRICIAN
AK001.147461	WESTWARD SEAFAROS, INCORPORATED	Registered	329 Driveway Street, Suite 2 Fairbanks AK 99701	ELECTRICIAN
AK001.147461	Will Cuts	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	WOODNORTH ELECTRIC	Registered	816 Whitney Road ANCHORAGE AK 99501	ELECTRICIAN
AK001.147461	YUKON-KUSKOKWIM DELTA APPRENTICESHIP PROGRAM	Registered	226 15th Avenue West SEATTLE WA 98119	ELECTRICIAN
AK001.147461	Zone Electric	Registered	P.O. BOX 320585 BIG LAKE AK 99657	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	384 Arctic Boulevard, Unit 8 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Suspended	507 Mill Bay Road Kodiak AK 99501	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	384 Arctic Boulevard, Unit 8 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	384 Arctic Boulevard, Unit 8 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ANCHORAGE ALASKA AREA RMC TRADERS LOCAL #89 ATC	Registered	1471 E 75TH AVENUE, #4 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ANCHORAGE ALASKA AREA RMC TRADERS LOCAL #89 ATC	Registered	672 WEST POTTER DRIVE ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ANCHORAGE ALASKA AREA RMC TRADERS LOCAL #89 ATC	Registered	P.O. BOX 0809 PALMER AK 99645	ELECTRICIAN
AK001.147461	ALASKA OPERATING ENGINEERS/EMPLOYERS TRAINING TRUST	Registered	3105 LANESHORE DR. BUILDING A, STE 101 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	TECK ALASKA, INC.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	P.O. Box 103212 Anchorage AK 99520	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	2505 borrow Street ANCHORAGE AK 99603	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	9751 Bay Street Anchorage AK 99515	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
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AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
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AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska, Inc.	Registered	30 Arctic Slope Avenue, Suite 2 100 ANCHORAGE AK 99518	ELECTRICIAN
AK001.147461	ABC of Alaska			

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

Program Number	Program Name	Program Status	Address	Occupation Title
A0000700015	ALASKA JOINT ELECTRICAL APPRENTICESHIP & TRAINING TRUST	Registered	5800 1ST ANCHORAGE AK 99518	LINE MAINTAINER (Alternate Title: Line Worker)
A0000700016	ALASKA OPERATING ENGINEERS/EMPLOYERS TRAINING TRUST	Registered	P.O. BOX 0809 PALMER AK 99645	LINE MAINTAINER (Alternate Title: Line Worker)
A0001080980	Alaska Power & Telephone	Registered	P.O. Box 34105 Juneau AK 99803	LINE MAINTAINER (Alternate Title: Line Worker)
A0000400002	Alaska Village Electric Cooperative, Inc.	Registered	4831 Eagle Street Anchorage AK 99503	LINE MAINTAINER (Alternate Title: Line Worker)
A0000800008	CITY & BOROUGH OF SITKA - ELECTRICAL DEPARTMENT	Registered	105 JARVIS STREET SITKA AK 99835	LINE MAINTAINER (Alternate Title: Line Worker)
A0001350005	CITY OF WRANGELL	Registered	P.O. Box 310 Unalakleet AK 99685	LINE MAINTAINER (Alternate Title: Line Worker)
A0001060005	CITY OF WRANGELL WRANGELL MUNICIPAL LIGHT & POWER	Registered	1064 Case Avenue WRANGELL AK 99529	LINE MAINTAINER (Alternate Title: Line Worker)
A0001070010	ICE SERVICES, INCORPORATED	Registered	2605 C STREET, SUITE 2B ANCHORAGE AK 99503	LINE MAINTAINER (Alternate Title: Line Worker)
A0001080978	North Slope Borough Power & Light	Registered	P.O. Box 350 Barrow AK 99723	LINE MAINTAINER (Alternate Title: Line Worker)
A000147462	Nushagak Electric & Telephone Cooperative, Inc.	Registered	P.O. Box 350 Dillingham AK 99576	LINE MAINTAINER (Alternate Title: Line Worker)
A0000700004	ALASKA OPERATING ENGINEERS/EMPLOYERS TRAINING TRUST	Registered	P.O. BOX 0809 PALMER AK 99645	LUBRICATION SERVICE MATERIAL DISPOSAL TECHNICIAN
A0000700015	ALASKA JOINT ELECTRICAL APPRENTICESHIP & TRAINING TRUST	Registered	5800 1ST ANCHORAGE AK 99518	MAINTENANCE MECHANIC, TELEPHONE
A0000000006	ALASKA WORKS PARTNERSHIP, INC.	Registered	1413 HYDER ST ANCHORAGE AK 99502	MAINTENANCE REPAIRER, BUILDING
A000125893	Goose Creek Correctional Center	Registered	P.O. Box 877790 Wasilla AK 99687	MAINTENANCE REPAIRER, BUILDING
A000125889	Hiland Mountain Correctional Center	Registered	9101 Heisterberg Road Eagle River AK 99577	MAINTENANCE REPAIRER, BUILDING
A0001900006	SPRING CREEK CORRECTIONAL CENTER	Registered	P.O. BOX 2109 SEWARD AK 99664	MAINTENANCE REPAIRER, BUILDING
A0001900010	Wildwood Correctional Center	Registered	BLDG 10, CHUGACH AVENUE KENAI AK 99611	MAINTENANCE REPAIRER, BUILDING
A0001910012	TECK ALASKA, INC.	Registered	3105 LAKESHORE DR., BUILDING A, STE 101 ANCHORAGE AK 99518	MECHANIC, INDUSTRIAL TRUCK
A000050001	Alaska Carpenters Training Trust	Registered	8751 King Street Anchorage AK 99515	MILLWRIGHT
A0001910012	TECK ALASKA, INC.	Registered	3105 LAKESHORE DR., BUILDING A, STE 101 ANCHORAGE AK 99518	OPERATING ENGINEER
A0000900003	ABC of Alaska, Inc.	Registered	301 Arctic Slope Avenue, Suite 100 ANCHORAGE AK 99518	OPERATING ENGINEER
A0000700004	ALASKA OPERATING ENGINEERS/EMPLOYERS TRAINING TRUST	Registered	P.O. BOX 0809 PALMER AK 99645	PAINTER (Construction)
A000147691	Wolverine Supply, Inc.	Registered	5099 E. Blue Lupine Drive Wasilla AK 99654	PAINTER (Construction)
A0000900003	ABC of Alaska, Inc.	Registered	301 Arctic Slope Avenue, Suite 100 ANCHORAGE AK 99518	PIPE FITTER (Construction)
A0000400001	International Union of Painters and Allied Trades Local 1959 IATC	Registered	5821 Arctic Boulevard, Unit 8 ANCHORAGE AK 99518	PIPE FITTER (Construction)
A0000900003	ABC of Alaska, Inc.	Registered	301 Arctic Slope Avenue, Suite 100 ANCHORAGE AK 99518	PIPE FITTER (Construction)
A0000400002	ANCHORAGE ALASKA AREA PIPE TRADES LOCAL #367 IATC	Registered	617 WEST POTTER DRIVE ANCHORAGE AK 99518	PIPE FITTER (Construction)
A0001510002	Fairbanks Area Plumbers & Pipefitters IATC	Registered	1978 BURGESS AVENUE FAIRBANKS AK 99709	PIPE FITTER (Construction)
A0000600001	JUNEAU PLUMBERS IATC	Registered	1751 ANKA STREET JUNEAU AK 99801	PLASTER
A0000700017	Alaska Towel Traders IATC	Registered	825 East 8th Avenue, Suite 10 Anchorage AK 99501	PLASTER
A0001092770	907 Heating and Plumbing	Registered	P.O. Box 220032 Anchorage AK 99522	PLUMBER
A0000900003	ABC of Alaska, Inc.	Registered	301 Arctic Slope Avenue, Suite 100 ANCHORAGE AK 99518	PLUMBER
A000125246	Ace Heating, Inc.	Registered	2780 N. Heatherway Circle Wasilla AK 99654	PLUMBER
A000109507	AI Fish Plumbing, LLC	Registered	11805 Gregory Road Anchorage AK 99516	PLUMBER
A000125896	Alaska Clearwater Mechanical, LLC	Registered	P.O. Box 709 Willow AK 99688	PLUMBER
A000125892	Alaska Native Tribal Health Consortium, Division of Environmental Health & Engineering	Registered	4500 Diplomacy Drive, Suite 454 Anchorage AK 99508	PLUMBER
A000113542	ALASKA PLUMBING & HEATING	Registered	P.O. Box 210240 Auke Bay AK 99821	PLUMBER
A0001090011	AI American Plumbing & Heating	Registered	9909 Antler Way Juneau AK 99801	PLUMBER
A000135008	AI Star Plumbing & Heating, LLC	Registered	11320 Bearpaw Street Anchorage AK 99516	PLUMBER
A0001070007	ALWAYS ON CALL MOUNTAIN MECHANICAL CORPORATION	Registered	8427 MENTRA STREET ANCHORAGE AK 99518	PLUMBER
A000157999	Amersco, Inc.	Registered	6643 Bratton Drive Anchorage AK 99507	PLUMBER
A000040002	ANCHORAGE ALASKA AREA PIPE TRADES LOCAL #367 IATC	Registered	617 WEST POTTER DRIVE ANCHORAGE AK 99518	PLUMBER
A0000700016	ANCHORAGE PLUMBING & HEATING, INC.	Registered	7600 King Street Anchorage AK 99518	PLUMBER
A0001090015	APPE PLUMBING & HEATING SERVICES, LLC	Registered	13087 E. Jessica Ann Street Sutton AK 99674	PLUMBER
A000084112	Arctic Chain Plumbing & Heating, Inc.	Registered	1200 East 76th Avenue, Unit 1220 Anchorage AK 99518	PLUMBER
2015-AK-68554	Arctic Plumbing & Heating, LLC	Registered	2215 Richardson Highway, Suite #2 North Pole AK 99705	PLUMBER
2015-AK-72300	Bradley Mechanical Company	Registered	2215 Richardson Highway North Pole AK 99705	PLUMBER
A000145922	Blades Mechanical	Registered	148 Hilted Avenue, #2 Subotva AK 99609	PLUMBER
A000145911	Bolshman Plumbing & Heating, Inc.	Registered	8900 Unalome Drive Palmer AK 99645	PLUMBER
A0001135713	BOYER MECHANICAL CONTRACTORS, INC.	Registered	13101 1st Drive Anchorage AK 99515	PLUMBER
A0000900003	Circle Mechanical, Incorporated	Registered	3317 Sista Street Anchorage AK 99502	PLUMBER
A00009002297	Circle Mechanical, Incorporated	Registered	3317 Sista Street Anchorage AK 99502	PLUMBER
A0001135717	D.H. Plumbing & Heating, Inc.	Suspended	7241 King Street Anchorage AK 99518	PLUMBER
A0001137000	Delico Plumbing & Heating, Incorporated	Registered	64525 PITMAN AVE Homer AK 99603	PLUMBER
A0001147690	Dawson Construction, Incorporated	Registered	4220 Cambria Drive West Kenai AK 99601	PLUMBER
A0001870004	DRNAL MECHANICAL, INC.	Registered	995 BILEY COURT FAIRBANKS AK 99701	PLUMBER
A0001167702	Discount Mechanical, LLC	Registered	P.O. Box 233654 Anchorage AK 99523	PLUMBER
A0001086585	Earn Plumbing & Heating, LLC	Registered	1308 Lakeshore Drive Homer AK 99603	PLUMBER
A0001040039	ENCORE MECHANICAL, INC.	Registered	P.O. BOX 1708 PALMER AK 99645	PLUMBER
A0001135726	Extreme Heating & Air, Incorporated	Registered	16005 Farm Avenue Eagle River AK 99577	PLUMBER
A0001510002	Fairbanks Area Plumbers & Pipefitters IATC	Registered	1978 BURGESS AVENUE FAIRBANKS AK 99709	PLUMBER
A000145926	Fedor's Plumbing & Heating, LLC	Registered	5902 Cordova Street Anchorage AK 99518	PLUMBER
A000125892	Funk Services	Registered	P.O. Box 672188 Chugiak AK 99567	PLUMBER
A000125249	Glacier Point Services	Registered	P.O. Box 61237 Fairbanks AK 99706	PLUMBER
A000135912	H and M Plumbing & Heating, Inc.	Registered	P.O. Box 222225 Anchorage AK 99522	PLUMBER
A0000400027	HARDROCK PLUMBING AND HEATING, LLC	Registered	4740 E. FATTIC DRIVE WASILLA AK 99654	PLUMBER
A0001050004	HEATCO, LLC	Registered	17141 N. EAGLE RIVER LOOP ROAD EAGLE RIVER AK 99577	PLUMBER
2015-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	137 East 4th Avenue, Suite 1 Anchorage AK 99501	PLUMBER
A0001070010	ICE SERVICES, INCORPORATED	Registered	2606 C STREET, SUITE 78 ANCHORAGE AK 99503	PLUMBER
A000168010	Icy Strait Plumbing and Heating	Registered	8282a Gamel Street Juneau AK 99801	PLUMBER
A0001108402	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 Tallkeena 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, Incorporated	Registered	5327 Kenai Spur Highway Kenai AK 99611	PLUMBER
A0000592650	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
A0000640001	JUNEAU PLUMBERS IATC	Registered	1751 AKA STREET JUNEAU AK 99801	PLUMBER
2017-AK-69607	Kaslof Plumbing & Heating	Registered	26547 S. Cohoe Loop Kodiak AK 99610	PLUMBER
A0001157698	Kiwi Mechanical	Registered	Box 2132 Cordova AK 99574	PLUMBER
A0001050012	KNK PLUMBING & HEATING	Registered	4915 W. 34TH 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
A000080234	Lewis Mechanical, Inc.	Registered	13240 View Heights Way Anchorage AK 99516	PLUMBER
A000050011	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-68689	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
A0001114890	Mr. Rooker 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 Firm Mechanical, LLC	Registered	P.O. Box 669 Haines AK 99827	PLUMBER
A0001070004	PARAGON PLUMBING & HEATING, INCORPORATED	Registered	3400 MACARTHUR STREET FAIRBANKS AK 99701	PLUMBER
A000000005	PARHUJIST MECHANICAL	Registered	P.O. BOX 1806 Palmer AK 99645	PLUMBER
A0001050006	PARTHUSCH PLUMBING & HEATING	Registered	8301 SCHOON STREET ANCHORAGE AK 99518	PLUMBER
A0001060010	PLEASANTS PLUMBING & HEATING	Registered	P.O. BOX 33051 JUNEAU AK 99803	PLUMBER
A0001167705	Pollard Construction	Suspended	P.O. Box 32811 Juneau AK 99803	PLUMBER
A0000952200	Portwinde Plumbing and Heating, Inc.	Registered	1500 Alaska Way Fairbanks AK 99709	PLUMBER
A0001109394	Premier Mechanical, LLC	Registered	2011 Millbay Road, #2 Kodiak AK 99615	PLUMBER
A0001167700	Red Hot Mechanical, Incorporated	Registered	11723 Old Glen Highway, Suite 107 Eagle River AK 99577	PLUMBER
A0001146735	River City Plumbing & Heating	Registered	865 6th Avenue Fairbanks AK 99701	PLUMBER
A0001177707	Rock Solid Plumbing & Heating	Registered	P.O. Box 674416 Wasilla AK 99687	PLUMBER
2017-AK-652	S.E. Plumbing, Incorporated	Registered	86 Garland Court Ketchikan AK 99901	PLUMBER
A000168008	Scott's Heating & Plumbing Services, Inc.	Registered	P.O. Box 22789 Fairbanks AK 99707	PLUMBER
A000098237	STATEWIDE MECHANICAL, LLC	Registered	P.O. Box 2132 Kodiak AK 99615	PLUMBER
A0001040017	STANDERD MECHANICAL, LLC	Registered	22750 MC MANUS DRIVE CHUGIAK AK 99567	PLUMBER
A000081122	Sundance Construction Company, Inc.	Registered	P.O. Box 561 Kaslof AK 99610	PLUMBER
A000095651	Superior Mechanical, Inc.	Registered	P.O. Box 62409 Fairbanks AK 99708	PLUMBER
2018-AK-71943	Tauman Mechanical Plumbing & Heating, LLC	Registered	780 W. 88th Avenue Anchorage AK 99515	PLUMBER
A0001070021	VALLEY MECHANICAL CONTRACTING, INCORPORATED	Registered	66731 TEXAL DRIVE WASILLA AK 99654	PLUMBER
A0001125707	Watworks Plumbing & Heating	Registered	P.O. Box 1974 Seldovia AK 99669	PLUMBER
2019-AK-72100	Wolf Pack Mechanical, LLC	Registered	P.O. Box 52118 Big Lake AK 99652	PLUMBER
A000030009	YUKON-KUSKOKWIM DELTA APPRENTICESHIP PROGRAM	Registered	P.O. BOX 869 BETHEL AK 99559	PLUMBER
A0000952654	Yukon River Plumbing, LLC	Registered	615 Steadman Street Ketchikan AK 99901	RESIDENTIAL CARPENTER
A000115357	Yukon River Plumbing, LLC	Registered	P.O. Box 339 Wadai Cove AK 99401	RESIDENTIAL CARPENTER
A000115394	Yukon River Plumbing, LLC	Registered	1245 CROSSON AVENUE FAIRBANKS AK 99701	RESIDENTIAL WIREMAN
A000050004	Yukon River Plumbing, LLC	Registered	8609 JST ANCHORAGE AK 99518	RESIDENTIAL WIREMAN
2018-AK-65772	Yukon River Plumbing, LLC	Registered	P.O. Box 8010 Fairbanks AK 99708	RESIDENTIAL WIREMAN
A000105017	Yukon River Plumbing, LLC	Registered	P.O. Box 1857 Teller AK 99645	RESIDENTIAL WIREMAN
A000110513	Yukon River Plumbing, LLC	Registered	P.O. Box 275768 Wasilla AK 99687	RESIDENTIAL WIREMAN
A0001135937	Yukon River Plumbing, LLC	Registered	2155 North Willapa Court Wasilla AK 99654	RESIDENTIAL WIREMAN
A000108511	Yukon River Plumbing, LLC	Registered	4193 Knoch Avenue Juneau AK 99801	RESIDENTIAL WIREMAN
A0001145713	Yukon River Plumbing, LLC	Registered	820 27TH AVENUE FAIRBANKS AK 99701	RESIDENTIAL WIREMAN
A000040014	Yukon River Plumbing, LLC	Registered	1634 Sterling Highway Homer AK 99603	RESIDENTIAL WIREMAN
2017-AK-69629	Yukon River Plumbing, LLC	Registered	2421 West Teller Drive Wasilla AK 99654	RESIDENTIAL WIREMAN
A0001060007	Yukon River Plumbing, LLC	Registered	P.O. Box 872965 Wasilla AK 99687	RESIDENTIAL WIREMAN
A0000900013	Yukon River Plumbing, LLC	Registered	P.O. BOX 87781 WASILLA AK 99687	RESIDENTIAL WIREMAN
A0001040007	Yukon River Plumbing, LLC	Registered	36784 Elmira Lake Road Chugiak AK 99567	RESIDENTIAL WIREMAN
A0001109400	Yukon River Plumbing, LLC	Registered	13811 Savage Drive Eagle River AK 99577	RESIDENTIAL WIREMAN
A0000550001	Yukon River Plumbing, LLC	Registered	8751 King Street Anchorage AK 99515	SCAFFOLD DIRECTOR
A0000950003	Yukon River Plumbing, LLC	Registered	301 Arctic Super Avenue, Suite 100 ANCHORAGE AK 99518	SHEET METAL WORKER
A0000500001	Yukon River Plumbing, LLC	Registered	1801 E. 75TH AVENUE, #4 ANCHORAGE AK 99518	SHEET METAL WORKER
A0001870004	Yukon River Plumbing, LLC	Registered	955 RILEY COURT FAIRBANKS AK 99701	SHEET METAL WORKER
A0001570001	Yukon River Plumbing, LLC	Registered	1260 AUKORA DRIVE FAIRBANKS AK 99709	SHEET METAL WORKER
A0001080587	Yukon River Plumbing, LLC	Registered	6673 E. Tex-A 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
A000950003	ABC of Alaska, Inc.	Registered	301 Arctic Slope Avenue, Suite 100 ANCHORAGE AK 99518	SPRINKLER FITTER (Existing Title: Pipe Fitter)
A000949002	ANCHORAGE ALASKA AREA PIPE TRADERS LOCAL #367 JATC	Registered	617 WEST POTTER DRIVE ANCHORAGE AK 99518	SPRINKLER FITTER (Existing Title: Pipe Fitter)
A0001510002	Fairbanks Area Plumbers & Pipefitters JATC	Registered	1578 BURGESS AVENUE FAIRBANKS AK 99709	SPRINKLER FITTER (Existing Title: Pipe Fitter)
A0000780016	ALASKA RIONWORKERS JATC	Registered	8441 SCHOON STREET ANCHORAGE AK 99518	STRUCTURAL STEEL WORKER (Alternate Titles: Ironworker or Structural Ironworker)
A0000000007	ALASKA TEAMSTER-EMPLOYER SERVICE TRAINING TRUST	Registered	520 East 34th Avenue, Suite 201 ANCHORAGE AK 99503	SURVEYOR ASSISTANT INSTRUMENT
A0009400001	ALASKA JOINT ELECTRICAL APPRENTICESHIP & TRAINING TRUST	Registered	5800 E STREET ANCHORAGE AK 99518	TREE TRIMMER (Line Clearance)
A0000000007	ALASKA TEAMSTER-EMPLOYER SERVICE TRAINING TRUST	Registered	520 East 34th Avenue, Suite 201 ANCHORAGE AK 99503	TRUCK DRIVER, HEAVY
2017-NH-68810	River Valley Workforce Institute, Inc.	Registered	325 Mount Support Road Lebanon NH 03766	WELDER, COMBINATION
A0001910012	TECK ALASKA, INC.	Registered	3105 JAKESHORE DR., BUILDING A, STE 101 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 (30-DAY)	\$ 2,500.00	
2ND CONSECUTIVE NON-COMPLIANCE (30-DAY)	\$ 5,000.00	
3RD CONSECUTIVE NON-COMPLIANCE (30-DAY)	\$ 8,000.00	
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

END OF SECTION

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

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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

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

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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;
- 1.2.5.12 Community Workforce Agreement

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.

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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

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.

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,

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.

- 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

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

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 the 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 If a FOB is issued, instead of keys, and is lost or stolen, the Contractor is required to immediately report the loss to the Project Manager. Notice is to be completed, in writing, within 12 hours or there will be a \$500 fine.
- 10.2.8.5 Upon completion of the Project and prior to final payment, the Contractor will return all key(s) to the Project Manager. A maximum per facility charge of up to \$10,000 may apply to any key not returned to the Project Manager.
- 10.2.8.6 Do not put any identifying tags or markers on the keys that would identify them as ASD building keys.

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.

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

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;

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 Division1, 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.

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 or 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;

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;
 - 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

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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 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

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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

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 1

Add the following new Paragraph 1.2.5.12:

- 1.2.5.12 Student Community Workforce Agreement

ARTICLE 4

Add the following new Paragraphs 4.7.1.2 & 4.7.1.3:

- 4.7.1.2 Unless otherwise authorized by the Project Manager, successfully obtaining the necessary permits shall be the responsibility of the Contractor and shall constitute a requirement for the issuance of the Notice to Proceed by the Owner.
- 4.7.1.3 Contractor shall submit Fire Alarm shop drawings to the Municipality of Anchorage Building Safety Office.
- 4.7.1.3.1 Contractor shall pay for the Municipality of Anchorage Fire Alarm permits.
- 4.7.1.3.2 Contractor shall obtain the permits upon approval.

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 projects will be conducted every 30 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.

Add the following new Paragraph 7.15, Student Community Workforce Agreement:

7.15 STUDENT COMMUNITY WORKFORCE AGREEMENT

- 7.15.1 Bidders are hereby notified that this project is subject to the Student Community Workforce Agreement (SCWA).

A Template of the SCWA has been provided in this solicitation. Bidders may direct questions to purchasing@asdk12.org for consideration or submission to the SCWA Committee.

No portion of the attached Student Community Workforce Agreement may be changed without agreement of the SCWA Committee and the Trades Council.

- 7.15.2 As part of the Award process, the successful low bidder will comply with Board Policy 3311.2 Student Community Workforce Agreement (SCWA). The completed and approved SCWA documents will be incorporated into the District Contract of Award.

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:

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: Removal and replacement of the boilers and other mechanical equipment, repair of a damaged roof beam in the boiler room, replacement of the boiler room flooring, related electrical work, related hazardous abatement work and minor patching and repairs of finishes
- B. 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. 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.
- B. 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.
- C. Contractor shall maintain an inspection log and retain copies of all inspection reports, on site, for review by inspection officials and district project representatives.
- D. The District will be requiring preconstruction meeting with municipality building safety department.

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.

1.010 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.

1.011 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.

1.012 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
ASAH	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

REFERENCED SPECIFICATIONS AND STANDARDS

Division 1
Section 01090

J.	F.S.	Federal Specifications of the United States General Services Administration Specifications and Consumer Information Distribution Section (WFSIS) 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.

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.

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 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.

1.010 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.

1.011 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.

1.012 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.

1.013 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 Building Demolition
3. Section 02 89 00 Minor Hazardous Materials Related Work

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 and 00800- General and Supplementary Conditions.
- 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 and 00800 - General and Supplementary Conditions.
- 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
LEVELING COURSE (D-1, RAP, ETC.)	GRADATION	1 PER SOIL TYPE AND NOTABLE CHANGE IN CHARACTERISTICS	PRIOR TO PLACEMENT	BEFORE USE ON PROJECT
	MOISTURE DENSITY (PROCTOR)			
	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			7 & 28 DAYS
	AIR CONTENT			
	TEMPERATURE			
	COMP. STRENGTH			
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			7 & 28 DAYS
	AIR CONTENT			
	TEMPERATURE			
	COMP. STRENGTH			
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			7 & 28 DAYS
	AIR CONTENT			
	TEMPERATURE			
	COMP. STRENGTH			

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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	
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.				

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 and 00800 - General and Supplementary Conditions.
 - 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

MAINTENANCE OF TRAFFIC

PART 1. GENERAL

1.01 DESCRIPTION OF WORK

- A. When working adjacent to school playgrounds, provide flagmen. Payment for such flagging and protective flagmen services shall be borne by Contractor.
- B. Contractor shall retain responsibility for traffic operations and protective measures to assure safe flow of traffic. Contractor shall cooperate with Owner so that traffic flow is minimally impeded by execution of work under this Contract.

1.02 SUBMITTALS

- A. Prior to starting any work, Contractor shall submit to the Authority having Jurisdiction and the Project Manager, detailed plan of his proposed method for controlling traffic at each affected location. Proposed traffic control plan shall show and describe proposed locations and time durations covering the following:
 - 1. Vehicular traffic routing including School Buses.
 - 2. Traffic blockage anticipated to be caused by work under this contract.
 - 3. Address conflicts between Pedestrian and vehicular traffic.

1.03 TRAFFIC MAINTENANCE FACILITIES

- A. Other than as shown on approved traffic control plans, at no time shall Contractor's operations interfere with safe and orderly operation of school. Encroachment by Contractor's operations will not be permitted.
- B. For duration of Contract, Contractor shall immediately repair or replace any and all appurtenances damaged or destroyed in performance of work included herein.
- C. Upon completion of work, temporary traffic maintenance items furnished by Contractor shall remain his property and shall be removed from site by Contractor.
- D. Contractor shall utilize dust control methods to control dust on access streets and project site to satisfaction of the Project Manager.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

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 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. PART 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 and 01651.
- 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. PART PRODUCTS (NOT USED)

PART 3. PART EXECUTION (NOT USED)

END OF SECTION

SYSTEM COMMISSIONING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and General Provisions of contract, including General and Supplementary Conditions and other Divisions of these Specifications, apply to work of this section.

1.02 DEFINITION

- A. Building Commissioning work is a joint team effort to ensure that all equipment and systems have been completely and properly installed and put into services. The commissioning work will begin only after all systems are 100% complete and functional. The factory start-up of all equipment must have been carried out as well as control system completion and start-up and balancing. The team is made up of representatives from the owner's Engineer and Contractor's organizations.
- B. The Contractor shall schedule system commissioning. The trades represented during the commissioning include sheet metal, piping and fitting, refrigeration, controls and balancing. The lead tradesmen for each trade who actually performed the work is to be present. All trades are to be present as scheduled during the commissioning session. The balancing and control contractors may be released when their portions of work have been completed. The Contractor will submit a schedule of activities for commissioning at least 30 days prior to beginning commissioning. A suggested schedule outline is as follows:
 - 1. Day One (Monday) Owner and Engineer; Mechanical Contractor optional.
 - 2. Day Two (Tuesday) Owner, Engineer, Balancing Contractor, Control Contractor and Mechanical Contractor.
 - 3. Day Three (Wednesday) Owner, Engineer, Balancing Contractor, Control Contractor, Mechanical Contractor including Sheet Metal Contractor and Fitter.
 - 4. Day Four (Thursday) Owner, Engineer, Mechanical Contractor, Sheet Metal Contractor, Fitter and Refrigeration Contractor.
 - 5. Day Five (Friday) Refrigeration Contractor and all parties from day four to complete tasks not completed previously.

1.03 DOCUMENTS

- A. The following documents shall be assembled and bound into the operating and maintenance manuals and delivered according to Section 01730, Maintenance Data.
 - 1. Plumbing sanitization certified.
 - 2. Certificates of Completion from the following Contractors:
 - a. Sheet Metal
 - b. Plumbing and Piping
 - c. Automatic Temperature Control
 - d. Refrigeration
 - e. Fire Protection
 - 3. Balancing report including duct pressure test.
 - 4. Boiler startup certificate, including stack gas test.
 - 5. Hydronic system water analysis report.
 - 6. Steam boiler water analysis report.
 - 7. All operating and maintenance data as described in Section 01730.

- B. Record Drawings will be submitted to District according to Section 01700, Contract Closeout.

1.04 SCOPE OF WORK

- A. The work included under this section includes a complete and thorough investigation of all systems in order to ensure proper installation and operation of all components and systems. The following systems will be evaluated:
 1. Automatic temperature controls.
 2. Instrumentation (gauges, thermometers, etc.)
 3. Air handling equipment.
 4. Air Distribution and exhaust systems.
 5. Boilers.
 6. Hydronic heating and steam distribution systems.
 7. Refrigeration equipment.
 8. Fire protection.
 9. Labeling, marking and color coding.

PART II - PRODUCTS

2.01 VALVE TAGS

- A. Tag all valves with round, numbered, brass tags. Fasten to valve stem with beaded chain. In boiler room and fan room provide a framed, typewritten directory under glass. Directory shall list all valve tag numbers, service of valve, system valve is located in, location of valve and whether valve is normally open or closed. Provide a separate tag sequence for each service. Each service prefix to be abbreviation used for that service (sprinkles, S-1, S-2, etc.; Air, A-1, A-2, etc.)

2.02 EQUIPMENT LABELS

- A. Label all equipment with heat resistant, laminated plastic labels having engraved lettering 1/2-inch high and fastened in place with rivets, screws or pressure sensitive, double sided tape, on back of label. Examples "Pump P-1," "Water Heater No. 1," "Exhaust Fan Ref-2," Air Handling Unit AHU-1," etc.

2.03 PIPING LABELS

- A. Label all service piping with adhesive backed, flexible, vinyl labels, sealed in clear polyester film. Secure labels with directional flow adhesive vinyl banding tape. Labels and tape to comply with ANSI A13.1-1982 for color and size.
- B. Manufacturer: Baker, Emed, Setmark, Seton.

2.04 WATER TREATMENT CHEMICALS

- A. Obtain the services of a professional water treatment firm for testing the steam boiler water and prescribing the treatment chemicals.
- B. Provide a one-year supply of treatment chemicals to maintain the boiler water at or below the following conditions.
 1. Neutralized specific conductance.
 2. Total alkalinity 600 ppm.
 3. Suspended solids 250 ppm.

4. Silica 90 ppm. The treatment will include a filming amine additive for protection of the condensate piping.
- C. Supply materials are to be based on boiler operation of 10 hours per week at 50% to 100% of capacity with 50% of condensate being returned to system.

PART III - EXECUTION

3.01 SYSTEM COMMISSIONING

- A. The following procedures will be verified during the commissioning process. All procedures are to be checked and carried out by the contractor prior to commissioning.

3.02 PRELIMINARY WALK THROUGH

- A. A preliminary walk through to provide a visual check of the various systems to verify that all components are properly installed. The following items will be observed.
- B. Air Distribution:
 1. Mounting and support of equipment.
 2. Noise, vibration, air and water leaks.
 3. Air filtration, presence of dampers, diffusers, grilles, fire dampers and access doors.
 4. Presence of thermostats and other adjustable temperature control devices.
 5. Presence of smoke sensors and other safety devices.
 6. Instrumentation, gauges, thermometers, flow measuring devices.
 7. Hoods and exhaust systems.
- C. Plumbing and Piping Systems:
 1. Mounting support of equipment.
 2. Noise, vibration and leaks.
 3. Strainers, valves fixtures and instrumentation and flow measuring or control.
- D. Heating and Cooling Equipment:
 1. General installation and service access.
 2. Proper cycling.
 3. Excessive noise, vibration or leads.
 4. Fuel storage, distribution instrumentation and filtration.
 5. Presence of safety devices and controls.
- E. Refrigeration Systems:
 1. Compressor operation and lubrication.
 2. Unit cooler operation.
 3. Cooling fluid flow and control.
 4. Temperature maintenance and instrumentation.
 5. Vibration, excessive noise and leaks.
- F. Fire Protection System:
 1. General installation and compliance with approved shop drawings and design drawings.
 2. Head locations.
 3. Proper functioning of alarms.
 4. NFPA certification - Chapter 13.
 5. Locate spare heads, wrench and NFPA 13A manual.

- G. Any discrepancies or deficiencies are to be noted for further investigation during the detailed evaluation.
- H. Verify that all cleaning has been completed.
- I. Verify that all touch-up painting has been completed.

3.03 DETAILED EVALUATION

- A. Air distribution systems:
 - 1. Spot checks of approximately 10% of air outlets will be made. Engineer will select outlets and air balancer will demonstrate a reading of that outlet. Where appropriate, the thermostat will be adjusted to simulate full cooling, full heating, hood operation, etc.
 - 2. Air balancer will demonstrate total air flow at each air handler at simulated full cooling and/or maximum fresh air.
 - 3. Air balancer will demonstrate proper air flow at each fume hood, based on previously marked sash positions.
 - 4. Air balancer will demonstrate proper air flow at each process hood.
 - 5. Demonstrate proper room static pressure with respect to adjacent space(s).
 - 6. Motor HP draw will be demonstrated at selected fan motors.
 - 7. Discrepancies between balancing report and spot check results will be dealt with to correct any deficiencies. In the event that significant deficiencies are detected, the entire balancing procedures may be required to be repeated.
 - 8. Any noted drafts or noisy air distribution devices will be evaluated and corrective action taken.
 - 9. Any balancing related problems identified during the Preliminary Walk Through will be addressed and corrected.
- B. Heat Transfer and Hydronic Systems:
 - 1. Contractor will demonstrate that strainers have been cleaned by team observation of approximately 5 strainers selected by the Engineer. If significant debris is found in selected strainers, all strainers will be cleaned.
 - 2. Balancer will demonstrate fluid flows at approximately 10% of flow control devices.
 - 3. Selected pumps will have amp draws demonstrated.
 - 4. Fluid temperatures and pressures will be observed at each system, and compared with design values.
 - 5. Glycol concentration will be measured for compliance with design specifications.
 - 6. Any noted deficiencies between the sample evaluations and the balancing report will be dealt with to correct any deficiencies. In the event that significant deficiencies are detected, the entire balancing procedures may be required to be repeated.
 - 7. Any balancing related problems identified during the Preliminary Walk Through will be addressed and corrected.
- C. HVAC Control Systems:
 - 1. The Control Contractor will demonstrate the proper function of each control system, and instruct Owner's operating personnel in the proper operation of the systems. The balancing contractor will be present to correct flows and assist in fine tuning system.
 - 2. Control Contractor will demonstrate the proper functioning of the following devices:
 - a. Each thermostat to adequately control heating and cooling.
 - b. Each automatic damper and valve.
 - c. Fresh air and return air dampers.
 - d. Economizer operation.

- e. Boiler, chiller and pump starting and stopping from program control.
 - f. Exhaust fan and air handler start and stop.
 - g. Variable air volume control of VAV air handlers, and tracking of associated return fan.
 - h. Variable air volume control of VAV exhaust fans
 - i. Freeze prevention control.
 - 3. Control Contractor will point out proper labeling of each control device.
 - 4. Control Contractor and Balancing Contractor will coordinate efforts as required until all functions of air distribution and hydronic systems have been fully demonstrated and have been accepted by the District and the Engineer.
- D. Sheet Metal Contractor will demonstrate the following:
- 1. Proper voltage, overload heater size and rotation of each motor driven fan or air handling device.
 - 2. Proper belt tension and drive alignment.
 - 3. Proper clearance and deflection of spring isolation of fans and drives.
 - 4. Proper installation of flexible connections.
 - 5. Sealing of all ductwork per specification.
 - 6. Complete insulation of ductwork and plenums and sound attenuation where required.
 - 7. Completion of any deficiencies pointed out during balancing and control system commissioning.
 - 8. Marking and labeling of each air handling device.
 - 9. Proper shutdown of air handling systems in the event of presence of smoke or products of combustion.
 - 10. Monitor bearings for heat buildup or noise.
 - 11. Demonstrate that heating and cooling coil fins are straight.
 - 12. Demonstrate operation and maintenance of humidification equipment.
 - 13. Sheet Metal Contractor will correct any deficiencies noted during Preliminary Walk Through and Detailed Evaluation.
 - 14. Correct any deficiencies discovered during Preliminary Walk Through and Detailed Investigation.
- E. Each Contractor will explain any special features or intricacies of system operation to the building operating personnel. Items covered should include safety features, hazards to be aware of, precautions to be observed to avoid damage to equipment and any necessary seasonal adjustments which are required. Generally discuss service frequency of devices such as bearings, belt drives, filters, strainers, etc. Show maintenance and operating personnel where additional information can be found in the Operating and Maintenance Manuals.
- F. Plumbing and Piping Contractor will demonstrate and explain the following:
- 1. The cleaning, degreasing and flushing of piping systems.
 - 2. The proper filling of hydronic and chilled water systems.
 - 3. Proper glycol concentration and Ph of hydronic and chilled water systems.
 - 4. Piping and valve marking.
 - 5. Equipment labeling.
 - 6. Demonstrate proper operation of fuel supply system.
 - 7. Demonstrate proper operation of sewage lift pump.
 - 8. Demonstrate proper operation of sump pumps.
 - 9. Tour facility and demonstrate proper installation and operation of plumbing fixtures and piping systems.
 - 10. Demonstrate and explain chemical feed equipment.
 - 11. Demonstrate operation of air compressor, deionized water equipment and other process equipment.

12. Correct any deficiencies discovered during Preliminary Walk through and Detailed Investigation.

- G. Refrigeration Contractor will instruct equipment operators and demonstrate and explain the following:

1. Proper charging and lubrication of each refrigeration system.
2. Vibration isolation of equipment.
3. Proper piping insulation.
4. Adequate air flow at cold diffusers.
5. Proper connection of piping.
6. Proper coolant flow and temperature.
7. Defrost of cold diffusers.
8. Maintenance of required temperature in cold boxes.
9. Proper maintenance and cleaning.
10. Labeling of equipment and control devices.
11. Verify proper voltage, rotation and overload heater sizing.
12. Correct any deficiencies noted during Preliminary Walk Through and Detailed Investigation.

3.04 CERTIFICATION

- A. The following certificate will be signed by each trade listed, indicating that all commissioning work has been completed and that all systems are installed according to the contract documents and manufacturer's installation instructions. The Contractors further certify that all adjustment, lubrication, alignment and startup procedures have been carried out.
- B. Individual Contractor Certifications: (see next page)

CERTIFICATE OF COMPLETION

(Building) _____

(Address) _____

1.	Mechanical Contractor	_____	_____	_____
		(firm)		
	(signature)	_____	(title)	_____ (date)
2.	Sheet Metal	_____	_____	_____
		(firm)		
	(signature)	_____	(title)	_____ (date)
3.	Plumbing	_____	_____	_____
		(firm)		
	(signature)	_____	(title)	_____ (date)
4.	Fitting	_____	_____	_____
		(firm)		
	(signature)	_____	(title)	_____ (date)
5.	Balancing	_____	_____	_____
		(firm)		
	(signature)	_____	(title)	_____ (date)
6.	Controls	_____	_____	_____
		(firm)		
	(signature)	_____	(title)	_____ (date)
7.	Refrigeration	_____	_____	_____
		(firm)		
	(signature)	_____	(title)	_____ (date)
8.	Insulation	_____	_____	_____
		(firm)		
	(signature)	_____	(title)	_____ (date)
9.	Fire Protection	_____	_____	_____
		(firm)		
	(signature)	_____	(title)	_____ (date)

10.	Refrigeration	_____	_____	_____
		(firm)		
	(signature)	_____	(title)	_____
				(date)
11.	Refrigeration	_____	_____	_____
		(firm)		
	(signature)	_____	(title)	_____
				(date)
12.	Refrigeration	_____	_____	_____
		(firm)		
	(signature)	_____	(title)	_____
				(date)

The engineer of record has observed the commissioning process and acknowledges that it was carried out according to the contract documents.

_____	_____
(firm)	(date)

(signature)	

The District has observed the commissioning and acknowledges that it was carried out to his satisfaction. The District acknowledges receipt of the following documents and services:

- 1. Operating and Maintenance Manuals
- 2. As-built Drawings
- 3. All Certificates
- 4. Operator Instruction

_____	_____
(organization)	(date)
_____	_____
(signature)	(date)
_____	_____
	(title)

3.05 SYSTEM WARRANTY

- A. The one-year warranty period which begins with beneficial use of the systems is the responsibility of the Contractor. It is the Contractor's responsibility to repair, adjust or replace any defective material and equipment during the warranty period. It is the Owner's responsibility to notify the Contractor of any deficiencies immediately.
- B. During the warranty period, the Owner and building operators should not make any system adjustments, alterations or repairs without first contacting the Contractor. Adjustment of room thermostats may be made at building occupant's discretion without first contacting the Contractor. The Contractor should be contacted as soon as possible so that a permanent repair can be carried out. The MAINTENANCE/ REPAIR REQUEST FORM (see example at the end of this section) should be used to report and document system malfunctions. Requests must be signed by building superintendent.
- C. Emergency repairs and adjustments may be made to prevent system or building components without first contacting the Contractor. Emergency procedures would include items such as repairing leaks, adjusting controls to prevent building freeze-up or other similar adjustments to prevent the building from becoming uninhabitable or unsafe.
- D. Maintenance procedures which are the responsibility of the building Owner during the warranty period include:
 - 1. Replacement of air filters.
 - 2. Replacement or repair of any items which are broken or damaged by building users.
 - 3. Replacement of water softener salt.
 - 4. Replacement (if required) acid neutralization marble.
 - 5. Cleaning of oil separators or grease traps.
- E. Maintenance / Repair Request:
 - 1. The form on the next page is to be used by the Owner and building occupants to document and report any malfunctions in mechanical systems.

MAINTENANCE / REPAIR REQUEST

Reported by _____ Phone (_____) _____ Date _____

Building Superintendent Signature _____

Describe Malfunction _____

_____Location (i.e. room number/above ceiling/etc.) _____

_____Describe any Temporary Adjustments or Repairs _____

_____What is the Urgency of Repair _____

Has this Been Reported by Telephone _____ to Whom _____

Name _____ Firm _____ Phone (____) _____

Date _____ Time _____ Action Promised _____

_____Repairs Made _____

by _____ Firm _____ Date _____

Contractor's Comments _____

Certification that repairs have been satisfactorily completed

(Building Superintendent) _____ Date _____ Time _____

Send one copy of this form to Contractor. Place one copy of this form in the Building Operating and Maintenance Manual under the appropriate tab.

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. Section 00700 and 00800 - 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 and 00800 - General and Supplementary 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 MAINTENANCE 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 01410 - Testing Laboratory Services
- D. Section 01420 - Special Inspections
- E. Section 01600 - Materials and Equipment
- F. Section 01700 - Project 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, shutdown, and emergency instructions. Include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Include routine procedures and guide for troubleshooting; 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 _____
Anchorage School District, and

entered into by the _____
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 _____

ASDF Form 102

**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



- 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

NOTICE OF COMPLETION OF PUBLIC WORKS

Additional Filing Fee May Be Required

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		
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.		
For Dept. Use Only		
T-36 Clearance Approved By _____ Department of Labor and Workforce Development		

D:\tie-temp\Temporary Internet Files\OLKF4\noticecompletionpublicworks.doc

(6/27/03)

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

DEPARTMENT USE ONLY

- ☐ *The above applicant is current on all taxes, penalties and interest due and
is in good standing with the Alaska Department of Revenue.*
- ☐ *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.*

Department of Revenue Representative

Date

*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@ov/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 Visitor Control Center	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

GENERAL

NOTIFICATIONS

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.

SECTION INCLUDES

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.

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.

CONTRACT DOCUMENTS AND RELATED REQUIREMENTS

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.

RELATED WORK

02 89 00 – Minor Hazardous Materials Related Work

PRODUCTS (NOT USED)

EXECUTION (NOT USED)

--- SEE ATTACHED ---

HAZARDOUS MATERIALS ASSESSMENT

Hazardous Materials Assessment

Anchorage School District (ASD),
Gruening Middle School Boiler Room Improvements,
Gruening Middle School,
9601 Lee Street,
Eagle River, Alaska 99577



Assessment Date: August 13, 2024
Report Date: November 11, 2024
HTRW, LLC Project No.: 2024-13



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HAZARDOUS MATERIALS ASSESSMENT

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APPENDIX D – DRAWINGS OF ASBESTOS AND LEAD TEST LOCATIONS

APPENDIX E – SUPPLEMENTAL INFORMATION

HAZARDOUS MATERIALS ASSESSMENT

1. Introduction and Executive Summary

Under contract to MCG Explore Design, HTRW, LLC performed a hazardous building materials assessment of portions of Gruening Middle School located at 9601 Lee Street in Eagle River, Alaska 99577. The objective of the assessment was to identify **common hazardous building materials** that may be affected by the proposed Gruening Middle School Boiler Room Improvements Project. Mr. Christopher T. Ottosen of HTRW, LLC performed the assessment on August 13, 2024 while the site was occupied.

The following **common hazardous building materials** were identified in the building: asbestos-containing materials, lead-containing materials, mercury-containing materials, PCB-containing materials, ozone depleting substances (ODS), heat transfer fluids, and devices 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
Roof mastics and "tabbing" tars	1	C
Black tarry vapor barrier seam tars at roof perimeters and penetrations	1	C
Flange gaskets	1	C
Valve packings	1	A
Black mastic for floor tiles	2	C
Rubber stair treads	2	C
Rubber stair stringers	2	C
Mastics on the metal trim pieces of carpeted corkboard wall panels	2	C
Brown mastic on "Marlite" wall panels	2	C
Black tarry lining of speaker box housings	2	C
Black undercoating on the bottom of stainless steel drinking fountains	2	C
White undercoating on the bottom of stainless steel sinks	2	C
Green and grey duct seam sealants	2	C
Black tarry coating on the inside of the filter housing for the kitchen heat exchanger	2	C

HAZARDOUS MATERIALS ASSESSMENT

ASBESTOS		
MATERIAL DESCRIPTION	EPA CATEGORY	ASSUMED/ CONFIRMED
Black pin mastic used to adhere wall and ceiling panels to substrate in the fan rooms above the Gym and MPR	2	C
Grey sealants on the exterior window perimeters, drip edges, and related window flashings at the roof level	2	C
Grey sealant on metal roof flashings, mechanical curbs, VTRs, and at rooftop siding and soffit intersections	2	C
Cement asbestos board behind exterior downspouts	2	C
Insulating materials inside of doors	RACM	A
Boiler gaskets, sealants, and insulating materials	V	C
Dark brown mastics used to adhere cove bases to substrate	≤1%	C
Joint compound on gypsum board systems (walls, ceilings, soffits, etc.)	NAD	C
Gypsum board	NAD	C
Hard white chalky insulation used on some of the boiler piping	NAD	C
Fluffy white insulation used inside of the boiler flues	NAD	C
Pliable dark grey sealant used on the seams of newer ductwork and HVAC system components	NAD	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*	C

HAZARDOUS MATERIALS ASSESSMENT

LEAD		
MATERIAL DESCRIPTION	EPA CATEGORY	ASSUMED/ CONFIRMED
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*	C
Metallic lead in VTR flashings	RCRA exempt scrap metal*	C
Metallic lead inside of roof drain bowls at clamping rings	RCRA exempt scrap metal*	None
Metallic sheet lead	RCRA exempt scrap metal*	-
Lead-acid batteries	Universal waste battery	C
Glazings of ceramic/porcelain wall tiles	Unclassified*	C
Glazings of ceramic/porcelain plumbing fixtures	Unclassified*	C
"Formica" laminate panels on cabinetry and countertops	Unclassified*	C
Various plastic, rubber, and vinyl-like products	Unclassified*	C

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
Universal waste batteries other than lead-acid batteries	Universal Waste	C
Mercury-containing lamps, fluorescent	Universal Waste	C
Mercury-containing lamps, high intensity discharge	Universal Waste	C
Mercury-containing lamps, neon	Universal Waste	-
Mercury-containing equipment, thermostats	Universal Waste	A
Mercury-containing equipment, HVAC system control switches	Universal Waste	A
Poured polyurethane flooring classified as a hazardous waste for mercury	RCRA Hazardous Waste	C

HAZARDOUS MATERIALS ASSESSMENT

OTHER COMMON HAZARDOUS BUILDING MATERIALS		
MATERIAL DESCRIPTION	EPA CATEGORY	ASSUMED/ CONFIRMED
PCB-containing light ballasts	TSCA PCB Bulk Product Waste and/or TSCA PCB Equipment	-
Contamination from leaking PCB-containing light ballasts	TSCA PCB Contaminated Electrical Equipment	-
Any material or product which contains greater than 1 mg/Kg of total PCBs	Alaska DEC Regulated PCB Waste	A
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	-

HAZARDOUS MATERIALS ASSESSMENT

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	None
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	None

HAZARDOUS MATERIALS ASSESSMENT

OTHER COMMON HAZARDOUS BUILDING MATERIALS		
MATERIAL DESCRIPTION	EPA CATEGORY	ASSUMED/ CONFIRMED
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	A
All electrical equipment at the building that has capacitors of any size or age, including those in loose electrical equipment	TSCA PCB Capacitor	-
PCB-containing equipment	TSCA PCB waste, category varies	-
Ozone Depleting Substances (ODS), consumer-grade refrigerators	CAA Class I or Class II Controlled Substance	A
Ozone Depleting Substances (ODS), consumer-grade freezers	CAA Class I or Class II Controlled Substance	A
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	A
Ozone Depleting Substances (ODS), commercial-grade freezers	CAA Class I or Class II Controlled Substance	A
Ozone Depleting Substances (ODS), commercial-grade air conditioning systems	CAA Class I or Class II Controlled Substance	C
Ozone Depleting Substances (ODS), drinking fountains	CAA Class I or Class II Controlled Substance	C
Ozone Depleting Substances (ODS), Halons	CAA Class I or Class II Controlled Substance	A
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*	A
Heat transfer fluids, unknown system contents	Unclassified*	A
Specialty paint products used in parking lot striping and similar features that may contain one or more of the following potentially hazardous constituents: lead, chromium, hexavalent chromium, silica, cadmium	Unclassified*	A

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.

HAZARDOUS MATERIALS ASSESSMENT

- Materials labeled with "Unclassified*" means the material requires additional testing to characterize the materials.

2. Generalized Building/Site Descriptions

Gruening Middle School was originally constructed in 1983, and major renovations and repairs occurred throughout the building during the 2022 Earthquake Recovery project. Numerous other smaller-scale renovation projects have occurred in various locations throughout the school between the original construction and the Earthquake Recovery project.

The Boiler Room had a poured concrete floor slab with a mixture of gypsum board and concrete block walls. The ceiling was generally covered in gypsum board, however, several areas of the gypsum board were damaged and/or had been removed to facilitate temporary shoring of damaged structural members.

World Language 101, Office 101A, Language Arts 160, and Social Studies 163 were heavily renovated during the 2022 Earthquake Recovery project and generally had carpeted floors with gypsum board walls and ceilings. "Tectum" wall panels were present in World Language 101 on some portions of the upper walls.

Corridors adjacent to the project areas generally had a newer vinyl-like sheet flooring with concrete block walls and gypsum board ceilings. Storage 114 had a bare concrete floor with a combination of gypsum board and concrete block walls and a gypsum board ceiling.

3. Project Summary

The project's main goals are to replace the existing boilers and associated equipment which are from the original construction as well as to repair structural deficiencies and damage in the Boiler Room. 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 devices 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.

HAZARDOUS MATERIALS ASSESSMENT

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 Gruening Middle School Boiler Room Improvements 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:
 - 1981 Original Construction Drawings with sheet specifications.
 - 1982 electrical shop drawings.
 - 1983 shop drawings for the original sprinkler system.
 - 1983 shop drawings for the original heating and ventilation systems.
 - 1984 sketches for seismic evaluations.
 - 1984 Ernest J. Gruening Jr. High School Corrective Actions with partial shop drawings.
 - 1985 site sketches.
 - 1988 Roof Renovation – Phase I.
 - 1989 Roof Renovation – Phase II.
 - 1990 Site Improvement Plan.
 - 1994 Fire Alarm System Upgrades.
 - 1995 Americans with Disabilities Act Accessibility Improvements.
 - 1995 Fire Alarm Layout sheets.
 - 1997 site plan by Omni Computer Technologies.
 - 1997 Replace UST.
 - 2001 Gym Relighting.
 - 2001 Gymnasium Mezzanine Addition.
 - 2001 Telecommunications As-Built.
 - 2002 Power and Data Upgrades in Support of Technology.
 - 2002 MPR Lighting Upgrade.
 - 2003 MPR Lighting Refurbishment.
 - 2004 Intercom System.
 - 2005/2006 9-School Boiler Conversion.
 - 2005 Plumbing Fixture Replacement.
 - 2005 8-School Boiler Conversion.
 - 2005 Multi-School Improvements Concrete Slabs and Emergency Tanks.
 - 2007 Standby Electrical Generator Project.
 - 2008 Domestic Water System Upgrades.
 - 2009 Roof Repairs.
 - 2009 Gym & Wrestling Divider Curtains Replacement.

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- 2012 CTE Applied Technology Construction Academy Upgrades.
- 2013 Lighting Upgrades.
- 2017 Special Education Department Renovation and Site Repair.
- 2022 Earthquake Recovery.
- Existing hazardous materials information:
 - Partial AHERA data from the ASD's records.
 - A Hazardous Materials Assessment dated May 08, 2020 by EHS-Alaska.

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. This laboratory was 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.

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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:

- Roof mastics and "tabbing" tars
 - Past reports have confirmed the presence of various asbestos-containing roof mastics and "tabbing tars". The roof was not inspected as part of the August 20242 hazmat assessment, but it is believed that all of the shingles which had the "tabbing tars" were removed during the 2022 Earthquake Recovery project. This report assumes that asbestos-containing roof mastics may be encountered on equipment or components which were not replaced during the 2022 Earthquake Recovery project.
- Black tarry vapor barrier seam tars at roof perimeters and penetrations
 - Other roof mastics were previously identified in one sample collected from the seam of the original vapor barrier adhered to the plywood roof deck and were assumed to be present at all roof perimeter within 3 feet of the roof edges and within 3 feet of all equipment penetrations. Although not included in the data provided by HTRW, it is understood that additional samples of the various mastics on the roof deck were collected during the 2022 Earthquake Recovery as the roof was being replaced, and that no asbestos was detected in any of those samples. This report assumes that the use of the asbestos-containing mastic was isolated to the location it was originally identified at which is outside of the project areas.
- Flange gaskets and Valve packings
 - Flange gaskets have been confirmed to contain asbestos at the building, 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. Both materials will require disturbance by the 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 that may be disturbed by this project include:

- Green and grey duct seam sealants
 - Previous reports have confirmed the presence of asbestos in green and grey sealants used on ductwork and HVAC systems in the building. This material was present on HVAC systems scheduled for demolition in both the Boiler Room and in the second floor corridor outside of the Band and Orchestra areas. Based on the locations of where the sealants were observed, as well as where sealants are assumed to be where observation was obscured, these sealants will require removal at both of these locations to accommodate the scope of work. Sealants and ductwork in Classrooms 160 and 163, as well as in the adjacent corridor and where the ducts run vertically to the second floor, were newer and did not contain asbestos. However, older ductwork with asbestos-containing sealants were present on both levels immediately adjacent to the

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ductwork scheduled for disturbance and therefore may be disturbed depending on the contractor's choice of means and methods to complete the work.

- Other Category II materials previously identified at the facility that are not anticipated to be disturbed by this project and are not discussed in detail include:
 - Black mastic for floor tiles (not observed in the project areas)
 - Rubber stair treads (not observed in the project areas)
 - Rubber stair stringers (not observed in the project areas)
 - Mastics on the metal trim pieces of carpeted corkboard wall panels (not observed in the project areas)
 - Brown mastic on "Marlite" wall panels (not observed in the project areas)
 - Black tarry lining of speaker box housings (not observed in the project areas)
 - Black undercoating on the bottom of stainless steel drinking fountains (not observed in the project areas)
 - White undercoating on the bottom of stainless steel sinks (not observed in the project areas)
 - Black tarry coating on the inside of the filter housing for the kitchen heat exchanger (appears to have been removed)
 - Black pin mastic used to adhere wall and ceiling panels to substrate in the fan rooms above the Gym and MPR (not observed in the project areas)
 - Grey sealants on the exterior window perimeters, drip edges, and related window flashings at the roof level (not observed in the project areas)
 - Grey sealant on metal roof flashings, mechanical curbs, VTRs, and at rooftop siding and soffit intersections (not observed in the project areas)
 - Cement asbestos board behind exterior downspouts (not observed in the project areas)

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. No doors are scheduled for disturbance by this project.

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:

- Boiler gaskets, sealants, and insulating materials
 - The boilers were confirmed to contain friable asbestos-containing gaskets in the front and rear observation ports the sight glass and at the rear pressure relief door assembly. Other asbestos-containing gaskets and

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sealants are assumed to have been used at various other locations throughout the boiler. Fiberglass insulation was observed between the sheet metal boiler covers and the inner cast iron sectionals, however, other types of insulating materials may have been used where they could not be observed. The boilers will be removed 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.

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:

- Dark brown mastics used to adhere cove bases to substrate
 - A sample of an older dark brown mastic used to adhere cove bases to substrates was confirmed to contain less than 1% asbestos by TEM NOB analysis. This material is present at the bases of all original construction walls which were scheduled to receive cove bases. The material is present within the project areas and may require minor disturbance to accommodate the scope of work.

Materials Which did not Contain Asbestos

Materials which did not contain asbestos and appear to have been satisfactorily sampled and characterized within the project areas include:

- Joint compound on gypsum board systems (walls, ceilings, soffits, etc.)
- Gypsum board
- Hard white chalky insulation used on some of the boiler piping
- Fluffy white insulation used inside of the boiler flues
- Pliable dark grey sealant used on the seams of newer ductwork and HVAC system components

Although these specific materials were found to not contain asbestos by any samples collected to date, additional sampling of these materials may be necessary or appropriate for future projects or for work outside of the project areas.

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

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- 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.

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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 2.201 mg/cm². Most readings with higher concentrations of lead were found in the factory paint on various mechanical components such as valves, pipe bends, pipe clamps, and flanges. Most other paints had relatively low lead concentrations. Paints observed at the site were typically in good condition, however, rust and general flaking and deterioration of paint was observed on various mechanical components in the Boiler Room. Previous testing at the school identified lead concentrations of up to 2.18 mg/cm² in the blue paint of the former concrete exterior, 1.45 mg/cm² in the orange paint on a metal locker, 1.28 mg/cm² in the orange paint on a door, 1.09 mg/cm² in the orange paint on a pump mount, among other various painted components throughout the interior and exterior of the school. Many of these components were removed during the 2022 Earthquake Recovery project.

Lead concentrations in solder were found up to 2.201 mg/cm² and were previously found to contain up to 7.84 mg/cm². It is assumed that there is solder with similar 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. Previous reports identified metallic lead flashings at VTRs, however, these are believed to have been removed during the 2022 Earthquake Recovery project.

Lead-containing glazings were previously identified on ceramic/porcelain wall tiles, floor tiles, sinks, toilets, and urinals.

Lead-containing "Formica" laminate panels were previously identified on countertops and cabinetry.

Other miscellaneous lead-containing materials identified at the building include plastic, rubber, and vinyl-like products.

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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

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- 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

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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), devices 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. 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

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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.

Depending on the total mercury content of poured polyurethane flooring materials using EPA Method SW-846-7174B, and additional analysis for leachable mercury using the Toxicity Characteristic Leaching Procedure (TCLP) using EPA Method 7470A, the flooring may be classified as either a Low Mercury Subcategory or High Mercury-Inorganic Subcategory hazardous waste in accordance with 40 CFR 261.

As a poured floor, it is assumed to have penetrated into porous surfaces, including adjacent concrete block walls and other porous surfaces.

One sample of the poured polyurethane flooring found in the Gym and adjacent rooms, as well as an additional sample of the poured flooring found on the upper level above the Gym and adjacent rooms, were previously collected and were analyzed for total mercury content using EPA Method SW-846-7174B (reportedly a modified method). Additional analysis for leachable mercury using the Toxicity Characteristic Leaching Procedure (TCLP) was performed, however, the analytical method was not described. The total mercury content of the flooring samples was reported as 130 mg/Kg (milligrams of mercury per Kilogram of analyte) of mercury for the sample on the first floor and 15 mg/Kg of mercury for the sample on the upper level above the Gym. The amount of leachable mercury of the flooring was reported as 1.30 mg/L (milligrams of mercury per Liter of leachate) of mercury for the sample on the first floor and 0.34 mg/Kg of mercury for the sample on the upper level above the Gym. Based on these results, the flooring is 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 floors, and was previously found in the ceiling spaces and other spaces between the upper and lower levels where the poured floor leaked past forms. The flooring material is 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.

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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 included inspection of a limited number of light fixtures in the building to determine if PCB-containing light ballasts and/or contamination from a former ballast were present.

This building may also 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

All lights fixtures observed appeared to have been replacement LED light fixtures which do not use ballasts and therefore did not contain PCB ballasts or contamination from a past leaking ballast.

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

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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.

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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.

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 was present in the Boiler Room in a heat pump, and other equipment with ODS are assumed to be present in other areas of the building, such as in consumer and commercial-grade refrigeration and air conditioning equipment. Formulations of ODS at the site are assumed to include both Class I and Class II ODS. R410A was noted in the heat pump, and other formulations are assumed to 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 which are not anticipated to require disturbance by this project.

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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 of 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 had a green-colored glycol heat transfer fluid of unknown formulation which is assumed to not be classified as a hazardous waste. The heat transfer fluids will require at least partial removal to accommodate the work.

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.

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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

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- 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, floor slabs, and housekeeping pads, ceramic products, 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

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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.

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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 Gruening Middle School Boiler Room Improvements 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 occupied, 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.

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Appendix A – Asbestos

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Appendix A.1 – Table of Asbestos Samples

Gruening Middle School, 9601 Lee Street, Eagle River, Alaska 99577				
SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	SAMPLE RESULTS
GR0824-A01	L1: Hark white chalky insulation on fiberglass pipe insulation	West side of Boiler Room 228 on the hot water return behind Boiler #3 at the damaged area of the insulation around the valve	73	L1: None Detected
GR0824-A02	L1: Hark white chalky insulation on fiberglass pipe insulation L2: Cheesecloth-like pipe wrap	West side of Boiler Room 228 on the hot water return behind Boiler #3 at the damaged area of the insulation at the end of the pipe bend to the northern hot water return port	74	L1: None Detected L2: None Detected
GR0824-A03	L1: Black flange gasket	West side of Boiler Room 228 between the northern hot water return port on the bottom rear of Boiler #3 and the flanged pipe bend	74	L1: 20% Chrysotile
GR0824-A04	L1: Off-white fibrous gasket used between the boiler plate observation port glass and the metal glass housing	West side of Boiler Room 228 on the back of Boiler #3	75	L1: 85% Chrysotile
GR0824-A05	L1: Off-white fibrous gasket used between the boiler plate observation port glass metal housing and the round plate it is attached to	West side of Boiler Room 228 on the back of Boiler #3	75	L1: 85% Chrysotile
GR0824-A06	L1: Off-white gasket used between the adapter plate to the boiler body and the round plate attached to the rear observation port	West side of Boiler Room 228 on the back of Boiler #3	75	L1: <1.0% Chrysotile
GR0824-A07	L1: Rubbery black sealant used between the rear adapter plate and the boiler body	West side of Boiler Room 228 on the back of Boiler #3	75	L1: None Detected
GR0824-A08	L1: Fluffy white insulation used inside of the boiler flues	West side of Boiler Room 228 from the flue for Boiler #3	76	L1: None Detected
GR0824-A09	L1: Green flange gasket	West side of Boiler Room 228 between black pipe bend and blue valve on the heating water return behind boiler #2	77	L1: None Detected

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Gruening Middle School, 9601 Lee Street, Eagle River, Alaska 99577				
SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	SAMPLE RESULTS
GR0824-A10	L1: Hark white chalky insulation on fiberglass pipe insulation L2: Cheesecloth-like pipe wrap	West side of Boiler Room 228 on the hot water return behind Boiler #2 at the damaged area of the insulation around the "tee"	78	L1: None Detected L2: None Detected
GR0824-A11	L1: Fluffy white insulation used inside of the boiler flues	West side of Boiler Room 228 from the flue for Boiler #2	79	L1: None Detected
GR0824-A12	L1: Brown flange gasket	On the flanged connection on the black low water cutoff valve on Boiler #2 near the center of Boiler Room 228	80	L1: None Detected
GR0824-A13	L1: Tan-colored pipe thread sealant	At western plug on the bottom of the front of Boiler #1 near the center of Boiler Room 228	81	L1: None Detected
GR0824-A14	L1: White ceramic wool-like gasket used between the boiler burner "flame tube" and the adapter plate to the body of the boiler L2: Clear silicone-like sealant used around the ceramic wool-like gasket	West side of Boiler Room 228 on the front of Boiler #1	82	L1: None Detected L2: None Detected
GR0824-A15	L1: White ceramic wool-like gasket used between the front boiler observation port glass and the metal glass retainer	West side of Boiler Room 228 on the front of Boiler #1	None	L1: None Detected
GR0824-A16	L1: Thick grey paper spark shield inside of the Honeywell temperature controller	West side of Boiler Room 228 on the front of Boiler #1	83	L1: None Detected
GR0824-A17	L1: Hark white chalky insulation on fiberglass pipe insulation L2: Cheesecloth-like pipe wrap	West side of Boiler Room 228 on the hot water supply above Boiler #1 at the end of the insulation around the valve	84	L1: Not found in sample by lab L2: None Detected
GR0824-A18	L1: Hark white chalky insulation on fiberglass pipe insulation L2: Cheesecloth-like pipe wrap	West side of Boiler Room 228 on the hot water return behind Boiler #1 at the damaged area of the insulation around the "tee"	85	L1: None Detected L2: None Detected
GR0824-A19	L1: Brown flange gasket	Between the hot water supply pipe to air separator tank connection near the center of Boiler Room 228	88	L1: None Detected

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Gruening Middle School, 9601 Lee Street, Eagle River, Alaska 99577				
SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	SAMPLE RESULTS
GR0824-A20	L1: Hark white pipe lagging used on the fiberglass insulation around the hot water supply tank L2: Cheesecloth-like pipe wrap	On the bottom of the air separator tank near the center of Boiler Room 228	89	L1: None Detected L2: None Detected
GR0824-A21	L1: Pliable dark grey sealant used on the seams of newer ductwork and HVAC system components	West side of Boiler Room 228 at connection between older and newer supply air ducts above Boiler #1	90	L1: None Detected by PLM or TEM NOB
GR0824-A22	L1: Grey cementitious grout/concrete floor slab patching material	West side of Boiler Room 228 next to beam supporting Boiler #3	91	L1: None Detected
GR0824-A23	L1: Grey concrete floor slab	West side of Boiler Room 228 at crack in concrete floor slab next to the supply air duct behind Boiler #1	92	L1: None Detected
GR0824-A24	L1: Semi-pliable dark grey sealant used on older ductwork and HVAC system components	West side of Boiler Room 228 at the bottom of the supply air duct behind Boiler #1	93	L1: 10% Chrysotile
GR0824-A25	L1: 4" grey cove base L2: Tan mastic used to adhere the cove base to substrate L3: White paint or a very thin layer of joint compound form the substrate	Southeast corner of World Language 101	104	L1: None Detected L2: None Detected L3: None Detected
GR0824-A26	L1: Mixture of sticky translucent yellowish carpet mastic and grey floor leveling compound	Southeast corner of World Language 101	105	L1: None Detected
GR0824-A27	L1: 4" grey cove base L2: Tan mastic used to adhere the cove base to substrate	East wall of Office 101A	106	L1: None Detected L2: None Detected
GR0824-A28	L1: Mixture of sticky translucent yellowish carpet mastic and an older yellow-tan mastic that appears to have been used to adhere a prior floor finish to the concrete substrate	East side of Office 101A	107	L1: None Detected

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Gruening Middle School, 9601 Lee Street, Eagle River, Alaska 99577				
SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	SAMPLE RESULTS
GR0824-A29	L1: Remnant black cove base material L2: Remnant dark brown mastic used to adhere a prior cove base to substrate L3: White joint compound	Western end of the south wall of Storage 114	108	L1: None Detected L2: None Detected by PLM; <0.25% Chrysotile by TEM NOB L3: None Detected
GR0824-A30	L1: 4" grey cove base L2: Tan mastic used to adhere the cove base to substrate	South wall of Language Arts 160 at "nook" for ductwork	110	L1: None Detected L2: None Detected by PLM or TEM NOB
GR0824-A31	L1: Grey floor leveling compound was able to be separated from "L2" layer below and was analyzed separately L2: Yellow carpet mastic layer originally part of "L1" was able to be separated by the lab and analyzed separately L3: Black tarry oakum-like expansion joint material in concrete floor slab	South side of Language Arts 160 at "nook" for ductwork	111	L1: None Detected L2: None Detected L3: None Detected
GR0824-A32	L1: Semi-pliable white sealant used between the metal return air duct and an access cover on the duct	South side of Language Arts 160	112	L1: None Detected by PLM or TEM NOB
GR0824-A33	L1: Pliable dark grey sealant used on the seams of newer ductwork and HVAC system components	South side of Language Arts 160	113	L1: None Detected
GR0824-A34	L1: Pliable dark grey sealant used on the seams of newer ductwork and HVAC system components	West side of Language Arts 160	114	L1: None Detected
GR0824-A35	L1: Pliable dark grey sealant used on the seams of newer ductwork and HVAC system components L2: A white sealant layer identified by the lab	Northwest corner of Social Studies 163	115	L1: None Detected L2: None Detected
GR0824-A36	L1: Semi-pliable white sealant used between a supply air duct penetration thru a gypsum board wall	Northwest corner of Social Studies 163	115	L1: None Detected
GR0824-A37	L1: White gypsum board	Northwest corner of Social Studies 163	115	L1: None Detected

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Gruening Middle School, 9601 Lee Street, Eagle River, Alaska 99577				
SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	SAMPLE RESULTS
GR0824-A38	L1: White joint compound	Above door frame at the northwest corner of Social Studies 163	116	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.

HAZARDOUS MATERIALS ASSESSMENT

Appendix A.2 – Final Laboratory Certificate of Analysis & Chain of Custody



CHAIN OF CUSTODY

003750926

11471 Business Blvd., #113444

Eagle River, Alaska 99577

(907)-917-3801

Project Number	2024-13			Selected Laboratory	iATL
Project Name	Request for Proposal 2024-608 Design Services: Gruening Middle School Boiler Room Upgrades			Shipping Method	FedEx, 7779 7884 0339
Address/Location	Gruening Middle School 9601 Lee Street, Eagle River, Alaska 99577			Date and Time	08/14/2024; 01:00 PM
Client	MCG Explore Design			Samples Received By	
Inspector/Collected By	Christopher T. Ottosen			Date and Time	
EPA B.I.# and State	TB14-124-18714/Alaska			Analyst Signature(s)	IG 16 2024
Collection Date	08/13/2024	Quantity	38	Turnaround	5-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
GR0824-A01	L1: Hark white chalky insulation on fiberglass pipe insulation	West side of Boiler Room 228 on the hot water return behind Boiler #3 at the damaged area of the insulation around the valve	73	
GR0824-A02	L1: Hark white chalky insulation on fiberglass pipe insulation L2: Cheesecloth-like pipe wrap	West side of Boiler Room 228 on the hot water return behind Boiler #3 at the damaged area of the insulation at the end of the pipe bend to the northern hot water return port	74	
GR0824-A03	L1: Black flange gasket	West side of Boiler Room 228 between the northern hot water return port on the bottom rear of Boiler #3 and the flanged pipe bend	74	
GR0824-A04	L1: Off-white fibrous gasket used between the boiler plate observation port glass and the metal glass housing	West side of Boiler Room 228 on the back of Boiler #3	75	
GR0824-A05	L1: Off-white fibrous gasket used between the boiler plate observation port glass metal housing and the round plate it is attached to	West side of Boiler Room 228 on the back of Boiler #3	75	
GR0824-A06	L1: Off-white gasket used between the adapter plate to the boiler body and the round plate attached to the rear observation port	West side of Boiler Room 228 on the back of Boiler #3	75	



CHAIN OF CUSTODY

003750926

11471 BUSINESS DRIVE, #114774
Eagle River, Alaska 99577
(907)-917-3801

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
GR0824-A07	L1: Rubbery black sealant used between the rear adapter plate and the boiler body	West side of Boiler Room 228 on the back of Boiler #3	75	
GR0824-A08	L1: Fluffy white insulation used inside of the boiler flues	West side of Boiler Room 228 from the flue for Boiler #3	76	
GR0824-A09	L1: Green flange gasket	West side of Boiler Room 228 between black pipe bend and blue valve on the heating water return behind boiler #2	77	
GR0824-A10	L1: Hark white chalky insulation on fiberglass pipe insulation L2: Cheesecloth-like pipe wrap	West side of Boiler Room 228 on the hot water return behind Boiler #2 at the damaged area of the insulation around the valve	78	
GR0824-A11	L1: Fluffy white insulation used inside of the boiler flues	West side of Boiler Room 228 from the flue for Boiler #2	79	
GR0824-A12	L1: Brown flange gasket	On the flanged connection on the black low water cutoff valve on Boiler #2 near the center of Boiler Room 228	80	
GR0824-A13	L1: Tan-colored pipe thread sealant	At western plug on the bottom of the front of Boiler #2 near the center of Boiler Room 228	81	
GR0824-A14	L1: White ceramic wool-like gasket used between the boiler burner "flame tube" and the adapter plate to the body of the boiler L2: Clear silicone-like sealant used around the ceramic wool-like gasket	West side of Boiler Room 228 on the front of Boiler #1	82	
GR0824-A15	L1: White ceramic wool-like gasket used between the front boiler observation port glass and the metal glass retainer	West side of Boiler Room 228 on the front of Boiler #1	None	
GR0824-A16	L1: Thick grey paper spark shield inside of the Honeywell temperature controller	West side of Boiler Room 228 on the front of Boiler #1	83	
GR0824-A17	L1: Hark white chalky insulation on fiberglass pipe insulation L2: Cheesecloth-like pipe wrap **DO NOT ANALYZE YELLOW FIBERGLASS INSULATION**	West side of Boiler Room 228 on the hot water supply above Boiler #1 at the end of the insulation around the valve	84	
GR0824-A18	L1: Hark white chalky insulation on fiberglass pipe insulation L2: Cheesecloth-like pipe wrap	West side of Boiler Room 228 on the hot water return behind Boiler #3 at the damaged area of the insulation around the valve	85	
GR0824-A19	L1: Brown flange gasket	Between the hot water supply pipe to air separator tank connection near the center of Boiler Room 228	88	
GR0824-A20	L1: Hark white pipe lagging used on the fiberglass insulation around the hot water supply tank L2: Cheesecloth-like pipe wrap **DO NOT ANALYZE YELLOW FIBERGLASS INSULATION**	On the bottom of the air separator tank near the center of Boiler Room 228	89	



CHAIN OF CUSTODY

003750926

 11471 Business Blvd., #11344
 Eagle River, Alaska 99577
 (907)-917-3801

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
GR0824-A21	L1: Pliable dark grey sealant used on the seams of newer ductwork and HVAC system components	West side of Boiler Room 228 at connection between older and newer supply air ducts above Boiler #1	90	
GR0824-A22	L1: Grey cementitious grout/concrete floor slab patching material	West side of Boiler Room 228 next to beam supporting Boiler #3	91	
GR0824-A23	L1: Grey concrete floor slab	West side of Boiler Room 228 at crack in concrete floor slab next to the supply air duct behind Boiler #1	92	
GR0824-A24	L1: Semi-pliable dark grey sealant used on older ductwork and HVAC system components	West side of Boiler Room 228 at the bottom of the supply air duct behind Boiler #1	93	
GR0824-A25	L1: 4" grey cove base L2: Tan mastic used to adhere the cove base to substrate L3: White paint or a very thin layer of joint compound form the substrate	Southeast corner of Computer Lab 101	104	
GR0824-A26	L1: Mixture of sticky translucent yellowish carpet mastic and grey floor leveling compound	Southeast corner of Computer Lab 101	105	
GR0824-A27	L1: 4" grey cove base L2: Tan mastic used to adhere the cove base to substrate	East wall of Office 101A	106	
GR0824-A28	L1: Mixture of sticky translucent yellowish carpet mastic and an older yellow-tan mastic that appears to have been used to adhere a prior floor finish to the concrete substrate	East side of Office 101A	107	
GR0824-A29	L1: Remnant black cove base material L2: Remnant dark brown mastic used to adhere a prior cove base to substrate L3: White joint compound	Western end of the south wall of Storage 114	108	
GR0824-A30	L1: 4" grey cove base L2: Tan mastic used to adhere the cove base to substrate	South wall of Language Arts 160 at "nook" for ductwork	110	
GR0824-A31	L1: Mixture of sticky translucent yellowish carpet mastic and grey floor leveling compound L2: Black tarry oakum-like expansion joint material in concrete floor slab	South side of Language Arts 160 at "nook" for ductwork	111	
GR0824-A32	L1: Semi-pliable white sealant used between the metal return air duct and an access cover on the duct	South side of Language Arts 160	112	
GR0824-A33	L1: Pliable dark grey sealant used on the seams of newer ductwork and HVAC system components	South side of Language Arts 160	113	
GR0824-A34	L1: Pliable dark grey sealant used on the seams of newer ductwork and HVAC system components	West side of Language Arts 160	114	
GR0824-A35	L1: Pliable dark grey sealant used on the seams of newer ductwork and HVAC system components	Northwest corner of Social Studies 163	115	



CHAIN OF CUSTODY

003750926

11471 Business Blvd., #773442
Eagle River, Alaska 99577
(907)-917-3801

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
GR0824-A36	L1: Semi-pliable white sealant used between a supply air duct penetration thru a gypsum board wall	Northwest corner of Social Studies 163	115	
GR0824-A37	L1: White gypsum board	Northwest corner of Social Studies 163	115	
GR0824-A38	L1: White joint compound	Above door frame at the northwest corner of Social Studies 163	116	
--END--				

ORIGIN: DANCA (907) 726-3568 CHRISTOPHER OTTOSEN HTRW, LLC 11471 BUSINESS BLVD. 77342 EAGLE RIVER, AK 99577 UNITED STATES US		SHIP DATE: 14AUG24 ACTWGT: 1.00 LB CAD: 255217397/NET4730
TO CUSTOMER SERVICE IATL 9000 COMMERCE PARKWAY SUITE B MOUNT LAUREL NJ 08054 PO: (877) 428-4285 INV: REF: 2024-132024-16 GMS AND SHES DEPT:		BILL RECIPIENT



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TRK# 7779 7884 0339

THU - 15 AUG 10:30A

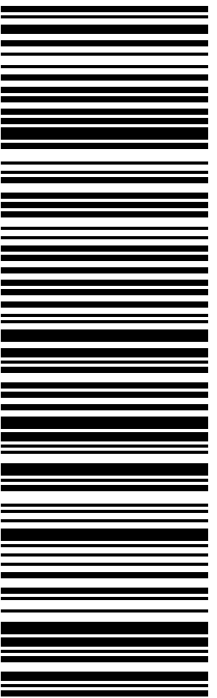
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Built Environment Testing
iATL

Report for:

Chris Ottosen
HTRW, LLC
11471 Business Blvd
#773442
Eagle River, AK 99577

Regarding: Eurofins EPK Built Environment Testing, LLC
Project: 2024-13 - Gruening Middle School Boiler Room Upgrades
EML ID: 3750926

Approved by:

Dates of Analysis:
Asbestos PLM (Layer %): 08-23-2024

A handwritten signature in black ink, appearing to read "Frank Ehrenfeld", is written over a light blue horizontal line.

Approved Signatory
Frank Ehrenfeld

Service SOPs: Asbestos PLM (Layer %) (EPA 40CFR App E to Sub E of Part 763 & EPA METHOD 600/R-93-116, SOP EM-AS-S-1267)

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the samples as received and tested. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

Eurofins EPK Built Environment Testing, LLC ("the Company"), a member of the Eurofins Built Environment Testing group of companies, shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

Eurofins EPK Built Environment Testing, LLC
9000 Commerce Parkway, Suite B, Mount Laurel, NJ 08054
(856) 231-9449 www.eurofinsus.com/Built

Client: HTRW, LLC
C/O: Chris Ottosen

Re: 2024-13 - Gruening Middle School Boiler Room Date of Receipt: 08-16-2024
Upgrades Date of Report: 08-23-2024

Bulk Asbestos Fiber Analysis by Polarized Light Microscopy (PLM)
Appx E Sub E 40 CFR 763 / EPA 600/R-93/116

Sample ID # Lab-ID version	Sample Description	Asbestos Constituents	Non-Asbestos Constituents	Comment
GR0824-A01. L1: Hark White Chalky Insulation; West Side of Boiler Room 228 on the Hot Water Return behind Boiler #3 at the Damaged Area of the Insulation around the Valve 18476930-1	Layer 1 White Insulation Homogeneity:Good	Not Detected	75% Non-Fibrous Material 15% Cellulose 10% Glass Fibers	
GR0824-A02. L1: Hark White Caulking Insulation L2: Cheesecloth- Like Pipe Wrap; West Side of Boiler Room 228 on the Hot Water Return behind Boiler #3 at the Damaged Area of the Insulation at the End of the Pipe Bend to the Northern Hot Water Return Port 18476931-1	Layer 1 White Insulation Homogeneity:Good	Not Detected	75% Non-Fibrous Material 15% Cellulose 10% Glass Fibers	
	Layer 2 Green Wrap Homogeneity:Good	Not Detected	70% Cellulose 30% Non-Fibrous Material	
GR0824-A03. L1: Black Flange Gasket; West Side of Boiler Room 228 between the Northern Hot Water Return Port on the Bottom Rear of Boiler #3 and the Flanged Pipe Bend 18476932-1	Layer 1 Black Gasket Homogeneity:Good	20% Chrysotile	80% Non-Fibrous Material	
GR0824-A04. L1: Off-White Fibrous Gasket; West Side of Boiler Room 228 on the Back of Boiler #3 18476933-1	Layer 1 White Gasket Homogeneity:Good	85% Chrysotile	15% Non-Fibrous Material	
GR0824-A05. L1: Off-White Fibrous Gasket; West Side of Boiler Room 228 on the Back of Boiler #3 18476934-1	Layer 1 White Gasket Homogeneity:Good	85% Chrysotile	15% Non-Fibrous Material	
GR0824-A06. L1: Off-White Fibrous Gasket; West Side of Boiler Room 228 on the Back of Boiler #3 18476935-1	Layer 1 Light Gray Gasket Homogeneity:Good	< 1% Chrysotile	90% Glass Fibers 10% Non-Fibrous Material	A
GR0824-A07. L1: Rubbery Black Sealant; West Side of Boiler Room 228 on the Back of Boiler #3 18476936-1	Layer 1 Black Gasket Homogeneity:Good	Not Detected	100% Non-Fibrous Material	

Comments: A)PC: Trace% (0/400); Loose Chrysotile fibers on the surface of gasket.

The total percentage of sample components shown may be greater than 100% when some components are detected at <1%.

The test report shall not be reproduced except in full, without written approval of the laboratory. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. The Company reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers of that type were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.

‡ A "Version" indicated by "-x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

Eurofins EPK Built Environment Testing, LLC
9000 Commerce Parkway, Suite B, Mount Laurel, NJ 08054
(856) 231-9449 www.eurofinsus.com/Built

Client: HTRW, LLC
C/O: Chris Ottosen

Re: 2024-13 - Gruening Middle School Boiler Room Upgrades
Date of Receipt: 08-16-2024
Date of Report: 08-23-2024

Bulk Asbestos Fiber Analysis by Polarized Light Microscopy (PLM)
Appx E Sub E 40 CFR 763 / EPA 600/R-93/116

Sample ID # Lab-ID version	Sample Description	Asbestos Constituents	Non-Asbestos Constituents	Comment
GR0824-A08. L1: Fluffy White Insulation; West Side of Boiler Room 228 from the Flue for Boiler #3 18476937-1	Layer 1 White Insulation Homogeneity:Good	Not Detected	90% Glass Fibers 10% Non-Fibrous Material	
GR0824-A09. L1: Green Flange Gasket; West Side of Boiler Room 228 between Black Pipe Bend and Blue Valve on the Heating Water Return behind Boiler #2 18476938-1	Layer 1 Green Gasket Homogeneity:Good	Not Detected	80% Non-Fibrous Material 15% Cellulose 5% Talc	
GR0824-A10. L1: Hark White Chalky Insulation L2: Cheesecloth-Like Pipe Wrap; West Side of Boiler Room 228 on the Hot Water Return behind Boiler #2 at the Damaged Area of the Insulation around the Valve 18476939-1	Layer 1 White Insulation Homogeneity:Good	Not Detected	75% Non-Fibrous Material 15% Cellulose 10% Glass Fibers	
	Layer 2 Green Wrap Homogeneity:Good	Not Detected	70% Cellulose 30% Non-Fibrous Material	
GR0824-A11. L1: Fluffy White Insulation; West Side of Boiler Room 228 from the Flue for Boiler #2 18476940-1	Layer 1 White Insulation Homogeneity:Good	Not Detected	90% Glass Fibers 10% Non-Fibrous Material	
GR0824-A12. L1: Brown Flange Gasket; On the Flanged COnnection on the Black Low Water Cutoff Vlave on Boiler #2 Near the Center of Boiler Room 228 18476941-1	Layer 1 Brown Gasket Homogeneity:Good	Not Detected	85% Non-Fibrous Material 10% Cellulose 5% Wollastonite	
GR0824-A13. L1: Tan-Colored Pipe Thread Sealant; At Westen Plug on the Bottom of the Front of Boiler #2 near the Center of Boiler Room 228 18476942-1	Layer 1 Tan Sealant Homogeneity:Good	Not Detected	95% Non-Fibrous Material 5% Wollastonite	

Comments:

The total percentage of sample components shown may be greater than 100% when some components are detected at <1%.

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Eurofins EPK Built Environment Testing, LLC
9000 Commerce Parkway, Suite B, Mount Laurel, NJ 08054
(856) 231-9449 www.eurofinsus.com/Built

Client: HTRW, LLC
C/O: Chris Ottosen

Re: 2024-13 - Gruening Middle School Boiler Room Upgrades
Date of Receipt: 08-16-2024
Date of Report: 08-23-2024

Bulk Asbestos Fiber Analysis by Polarized Light Microscopy (PLM)
Appx E Sub E 40 CFR 763 / EPA 600/R-93/116

Sample ID # Lab-ID version	Sample Description	Asbestos Constituents	Non-Asbestos Constituents	Comment
GR0824-A14. L1: White Ceramic Wool-Like Gasket L2: Clear Silicon-Like Sealant; West Side of Boiler Room 228 on the Front of Boiler #1 18476943-1(cont.)	Layer 1 White Insulation Homogeneity:Good	Not Detected	90% Glass Fibers 10% Non-Fibrous Material	
	Layer 2 Clear Sealant Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
GR0824-A15. L1: White Ceramic Wool-Like Gasket; West Side of Boiler Room 228 on the Front of Boiler #1 18476944-1	Layer 1 White Insulation Homogeneity:Good	Not Detected	90% Glass Fibers 10% Non-Fibrous Material	
GR0824-A16. L1: Thick Grey Paper Spark Sheild; West Side of Boiler Room 228 on the Front of Boiler #1 18476945-1	Layer 1 Gray Paper Homogeneity:Good	Not Detected	90% Cellulose 10% Non-Fibrous Material	
GR0824-A17. L1: Hark White Chalky Insulation L2: Cheesecloth-Like Pipe Wap; West Side of Boiler Room 228 on the Hot Water Supply above Boiler #1 at the End of the Insulation around the Valve 18476946-1	Layer 1 Green Wrap Homogeneity:Good	Not Detected	70% Cellulose 30% Non-Fibrous Material	A
GR0824-A18. L1: Hark White Chalky Insulation L2: Cheesecloth-Like Pipe Wap; West Side of Boiler Room 228 on the Hot Water Return behind Boiler #3 at the Damaged Area of the Insulation around the Valve 18476947-1	Layer 1 White Insulation Homogeneity:Good	Not Detected	75% Non-Fibrous Material 15% Cellulose 10% Glass Fibers	
	Layer 2 Green Wrap Homogeneity:Good	Not Detected	70% Cellulose 30% Non-Fibrous Material	
GR0824-A19. L1: Brown Flange Gasket; Between the Hot Water Supply Pipe to Air Separator Tank Connection near the Center of Boiler Room 228 18476948-1	Layer 1 Brown Gasket Homogeneity:Good	Not Detected	80% Non-Fibrous Material 20% Cellulose	

Comments: A)No chalky insulation provided, Yellow FG insulation not analyzed per client request.

The total percentage of sample components shown may be greater than 100% when some components are detected at <1%.

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Eurofins EPK Built Environment Testing, LLC
9000 Commerce Parkway, Suite B, Mount Laurel, NJ 08054
(856) 231-9449 www.eurofinsus.com/Built

Client: HTRW, LLC
C/O: Chris Ottosen

Re: 2024-13 - Gruening Middle School Boiler Room Upgrades
Date of Receipt: 08-16-2024
Date of Report: 08-23-2024

Bulk Asbestos Fiber Analysis by Polarized Light Microscopy (PLM)
Appx E Sub E 40 CFR 763 / EPA 600/R-93/116

Sample ID # Lab-ID version	Sample Description	Asbestos Constituents	Non-Asbestos Constituents	Comment
GR0824-A20. L1: Hark White Pipe Lagging L2: Cheesecloth-Like Pipe Wap; On the Bottom of the Air Separator Tank near the Center of Boiler Room 228 18476949-1	Layer 1 White Sealant Homogeneity:Good	Not Detected	100% Non-Fibrous Material	A
	Layer 2 White Wrap Homogeneity:Good	Not Detected	70% Cellulose 30% Non-Fibrous Material	A
GR0824-A21. L1: Pliable Dark Grey Sealant; West Side of Boiler Room 228 at Connection between Older and Newer Supply Air Ducts above Boiler #1 18476950-1	Layer 1 Gray Sealant Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
GR0824-A22. L1: Grey Cementitious Grout/Concrete Floor Slab Patching Material; West Side of Boiler Room 228 next to Beam Supporting Boiler # 3 18476951-1	Layer 1 Gray Cementitious Material Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
GR0824-A23. L1: Grey Concrete Floor Slab; West Side of Boiler Room 228 at Crack in Concrete Floor Slab next to the Supply Air Duct behind Boiler #1 18476952-1	Layer 1 Gray Concrete Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
GR0824-A24. L1: 4" Gray Cove Base L2: Tan Mastic L3: White Paint; Southeast Corner of Computer Lab 101 18476953-1	Layer 1 Gray Sealant Homogeneity:Good	10% Chrysotile	90% Non-Fibrous Material	
GR0824-A25. L1: Mixture of Sticky Translucent Yellowish Carpet Mastic and Grey Floor Leveling Compound; Southeast Corner of Computer Lab 101 18476954-1	Layer 1 Gray Cove Base Homogeneity:Good	Not Detected	100% Non-Fibrous Material	

Comments: A)Yellow FG not analyzed per client request.

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Eurofins EPK Built Environment Testing, LLC
9000 Commerce Parkway, Suite B, Mount Laurel, NJ 08054
(856) 231-9449 www.eurofinsus.com/Built

Client: HTRW, LLC
C/O: Chris Ottosen

Re: 2024-13 - Gruening Middle School Boiler Room Upgrades
Date of Receipt: 08-16-2024
Date of Report: 08-23-2024

Bulk Asbestos Fiber Analysis by Polarized Light Microscopy (PLM)
Appx E Sub E 40 CFR 763 / EPA 600/R-93/116

Sample ID # Lab-ID version	Sample Description	Asbestos Constituents	Non-Asbestos Constituents	Comment
GR0824-A25. L1: Mixture of Sticky Translucent Yellowish Carpet Mastic and Grey Floor Leveling Compound; Southeast Corner of Computer Lab 101 18476954-1(cont.)	Layer 2 Tan Mastic Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
	Layer 3 White Joint Compound Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
GR0824-A26. L1: 4" Grey Cove Base L2: Tan Mastic; East Wall of Office 101A 18476955-1	Layer 1 Yellow Mastic with Gray Leveling Compound Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
GR0824-A27. L1: Mixture of Sticky Translucent Yellowish Carpet Mastic and Older Yellow-Tan Mastic; East Wall of Office 101A 18476956-1	Layer 1 Gray Cove Base Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
	Layer 2 Tan Mastic Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
GR0824-A28. L1: Remnant Black Cove Base L2: Remnant Dark Brown Mastic L3: White Joint Compound; Western End of the South Wall of Storage 114 18476957-1	Layer 1 Yellow Mastic Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
GR0824-A29. L1: 4" Cove Base L2: Tan Mastic; South Wall of Language Arts 160 at "Nook" for Ductwork 18476958-1	Layer 1 Black Cove Base Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
	Layer 2 Brown Mastic Homogeneity:Good	Not Detected	98% Non-Fibrous Material 2% Talc	
	Layer 3 White Joint Compound Homogeneity:Good	Not Detected	100% Non-Fibrous Material	

Comments:

The total percentage of sample components shown may be greater than 100% when some components are detected at <1%.

The test report shall not be reproduced except in full, without written approval of the laboratory. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. The Company reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers of that type were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.

‡ A "Version" indicated by "-x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

Eurofins EPK Built Environment Testing, LLC
9000 Commerce Parkway, Suite B, Mount Laurel, NJ 08054
(856) 231-9449 www.eurofinsus.com/Built

Client: HTRW, LLC
C/O: Chris Ottosen

Re: 2024-13 - Gruening Middle School Boiler Room Date of Receipt: 08-16-2024
Upgrades Date of Report: 08-23-2024

Bulk Asbestos Fiber Analysis by Polarized Light Microscopy (PLM)
Appx E Sub E 40 CFR 763 / EPA 600/R-93/116

Sample ID # Lab-ID version	Sample Description	Asbestos Constituents	Non-Asbestos Constituents	Comment
GR0824-A30. L1: Mixture of Sticky Translucent Yellowish Carpet Mastic and Grey Floor Leveling Compound L2: Black Tarry Oakum-Like Expansion Joint Material; South Side of Language Arts 160 at "Nook" for Ductwork 18476959-1	Layer 1 Gray Cove Base Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
	Layer 2 Tan Mastic Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
GR0824-A31. L1: Semi-Pliable White Sealant; South Side of Language Arts 160 18476960-1	Layer 1 Gray Leveling Compound Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
	Layer 2 Tan Flooring Material Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
	Layer 3 Black Insulation Homogeneity:Good	Not Detected	90% Cellulose 10% Non-Fibrous Material	
GR0824-A32. L1: Pliable Dark Grey Sealant; South Side of Language Arts 160 18476961-1	Layer 1 White Sealant Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
GR0824-A33. L1: Pliable Dark Grey Sealant; South Side of Language Arts 160 18476962-1	Layer 1 Gray Sealant Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
GR0824-A34. L1: Pliable Dark Grey Sealant; West Side of Language Arts 160 18476963-1	Layer 1 Gray Sealant Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
GR0824-A35. L1: Pliable Dark Grey Sealant; Northwest Corner of Social Studies 163 18476964-1	Layer 1 Gray Sealant Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
	Layer 2 White Sealant Homogeneity:Good	Not Detected	100% Non-Fibrous Material	

Comments:

The total percentage of sample components shown may be greater than 100% when some components are detected at <1%.

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‡ A "Version" indicated by "-x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

Eurofins EPK Built Environment Testing, LLC
9000 Commerce Parkway, Suite B, Mount Laurel, NJ 08054
(856) 231-9449 www.eurofinsus.com/Built

Client: HTRW, LLC
C/O: Chris Ottosen

Re: 2024-13 - Gruening Middle School Boiler Room Upgrades
Date of Receipt: 08-16-2024
Date of Report: 08-23-2024

Bulk Asbestos Fiber Analysis by Polarized Light Microscopy (PLM)
Appx E Sub E 40 CFR 763 / EPA 600/R-93/116

Sample ID # Lab-ID version	Sample Description	Asbestos Constituents	Non-Asbestos Constituents	Comment
GR0824-A36. L1: Semi-Pliable White Sealant; Northwest Corner of Social Studies 163 18476965-1	Layer 1 White Sealant Homogeneity:Good	Not Detected	100% Non-Fibrous Material	
GR0824-A37. L1: White Gypsum Board; Northwest Corner of Social Studies 163 18476966-1	Layer 1 White Drywall with Brown Paper Homogeneity:Good	Not Detected	85% Non-Fibrous Material 15% Cellulose	
GR0824-A38. L1: White Joint Compound; Above Door Frame at the Northwest Corner of Social Studies 163 18476967-1	Layer 1 White Joint Compound Homogeneity:Good	Not Detected	100% Non-Fibrous Material	

Comments:

Analyst(s): Aidan Becker

The total percentage of sample components shown may be greater than 100% when some components are detected at <1%.

The test report shall not be reproduced except in full, without written approval of the laboratory. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. The Company reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers of that type were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.

‡ A "Version" indicated by "-x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".



CHAIN OF CUSTODY

003750926

11471 Business Blvd., #115444
Eagle River, Alaska 99577
(907)-917-3801

Project Number	2024-13			Selected Laboratory	iATL
Project Name	Request for Proposal 2024-608 Design Services: Gruening Middle School Boiler Room Upgrades			Shipping Method	FedEx, 7779 7884 0339
Address/Location	Gruening Middle School 9601 Lee Street, Eagle River, Alaska 99577			Date and Time	08/14/2024; 01:00 PM
Client	MCG Explore Design			Samples Received By	[Signature]
Inspector/Collected By	Christopher T. Ottosen			Date and Time	
EPA B.I.# and State	TBI4-124-18714/Alaska			Analyst Signature(s)	IG 16 2024
Collection Date	08/13/2024	Quantity	38	Turnaround	5-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
GR0824-A01	L1: Hark white chalky insulation on fiberglass pipe insulation	West side of Boiler Room 228 on the hot water return behind Boiler #3 at the damaged area of the insulation around the valve	73	
GR0824-A02	L1: Hark white chalky insulation on fiberglass pipe insulation L2: Cheesecloth-like pipe wrap	West side of Boiler Room 228 on the hot water return behind Boiler #3 at the damaged area of the insulation at the end of the pipe bend to the northern hot water return port	74	
GR0824-A03	L1: Black flange gasket	West side of Boiler Room 228 between the northern hot water return port on the bottom rear of Boiler #3 and the flanged pipe bend	74	
GR0824-A04	L1: Off-white fibrous gasket used between the boiler plate observation port glass and the metal glass housing	West side of Boiler Room 228 on the back of Boiler #3	75	
GR0824-A05	L1: Off-white fibrous gasket used between the boiler plate observation port glass metal housing and the round plate it is attached to	West side of Boiler Room 228 on the back of Boiler #3	75	
GR0824-A06	L1: Off-white gasket used between the adapter plate to the boiler body and the round plate attached to the rear observation port	West side of Boiler Room 228 on the back of Boiler #3	75	

ANALYZED TEM: [Signature] 8/17/24

2024-13-PLM-COC



CHAIN OF CUSTODY

003750926

11471 BUSINESS DRIVE, #773774
Eagle River, Alaska 99577
(907)-917-3801

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
GR0824-A07	L1: Rubbery black sealant used between the rear adapter plate and the boiler body	West side of Boiler Room 228 on the back of Boiler #3	75	
GR0824-A08	L1: Fluffy white insulation used inside of the boiler flues	West side of Boiler Room 228 from the flue for Boiler #3	76	
GR0824-A09	L1: Green flange gasket	West side of Boiler Room 228 between black pipe bend and blue valve on the heating water return behind boiler #2	77	
GR0824-A10	L1: Hark white chalky insulation on fiberglass pipe insulation L2: Cheesecloth-like pipe wrap	West side of Boiler Room 228 on the hot water return behind Boiler #2 at the damaged area of the insulation around the valve	78	
GR0824-A11	L1: Fluffy white insulation used inside of the boiler flues	West side of Boiler Room 228 from the flue for Boiler #2	79	
GR0824-A12	L1: Brown flange gasket	On the flanged connection on the black low water cutoff valve on Boiler #2 near the center of Boiler Room 228	80	
GR0824-A13	L1: Tan-colored pipe thread sealant	At western plug on the bottom of the front of Boiler #2 near the center of Boiler Room 228	81	
GR0824-A14	L1: White ceramic wool-like gasket used between the boiler burner "flame tube" and the adapter plate to the body of the boiler L2: Clear silicone-like sealant used around the ceramic wool-like gasket	West side of Boiler Room 228 on the front of Boiler #1	82	
GR0824-A15	L1: White ceramic wool-like gasket used between the front boiler observation port glass and the metal glass retainer	West side of Boiler Room 228 on the front of Boiler #1	None	
GR0824-A16	L1: Thick grey paper spark shield inside of the Honeywell temperature controller	West side of Boiler Room 228 on the front of Boiler #1	83	
GR0824-A17	L1: Hark white chalky insulation on fiberglass pipe insulation L2: Cheesecloth-like pipe wrap **DO NOT ANALYZE YELLOW FIBERGLASS INSULATION**	West side of Boiler Room 228 on the hot water supply above Boiler #1 at the end of the insulation around the valve	84	
GR0824-A18	L1: Hark white chalky insulation on fiberglass pipe insulation L2: Cheesecloth-like pipe wrap	West side of Boiler Room 228 on the hot water return behind Boiler #3 at the damaged area of the insulation around the valve	85	
GR0824-A19	L1: Brown flange gasket	Between the hot water supply pipe to air separator tank connection near the center of Boiler Room 228	88	
GR0824-A20	L1: Hark white pipe lagging used on the fiberglass insulation around the hot water supply tank L2: Cheesecloth-like pipe wrap **DO NOT ANALYZE YELLOW FIBERGLASS INSULATION**	On the bottom of the air separator tank near the center of Boiler Room 228	89	

2024-13-PLM-COC



CHAIN OF CUSTODY

003750926

11471 BUSINESS DIV., #773442
Eagle River, Alaska 99577
(907)-917-3801

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
GR0824-A21	L1: Pliable dark grey sealant used on the seams of newer ductwork and HVAC system components	West side of Boiler Room 228 at connection between older and newer supply air ducts above Boiler #1	90	7783697
GR0824-A22	L1: Grey cementitious grout/concrete floor slab patching material	West side of Boiler Room 228 next to beam supporting Boiler #3	91	IATL 7783697
GR0824-A23	L1: Grey concrete floor slab	West side of Boiler Room 228 at crack in concrete floor slab next to the supply air duct behind Boiler #1	92	
GR0824-A24	L1: Semi-pliable dark grey sealant used on older ductwork and HVAC system components	West side of Boiler Room 228 at the bottom of the supply air duct behind Boiler #1	93	
GR0824-A25	L1: 4" grey cove base L2: Tan mastic used to adhere the cove base to substrate L3: White paint or a very thin layer of joint compound form the substrate	Southeast corner of Computer Lab 101	104	IATL 7783698
GR0824-A26	L1: Mixture of sticky translucent yellowish carpet mastic and grey floor leveling compound	Southeast corner of Computer Lab 101	105	
GR0824-A27	L1: 4" grey cove base L2: Tan mastic used to adhere the cove base to substrate	East wall of Office 101A	106	IATL 7783699
GR0824-A28	L1: Mixture of sticky translucent yellowish carpet mastic and an older yellow-tan mastic that appears to have been used to adhere a prior floor finish to the concrete substrate	East side of Office 101A	107	
GR0824-A29	L1: Remnant black cove base material L2: Remnant dark brown mastic used to adhere a prior cove base to substrate L3: White joint compound	Western end of the south wall of Storage 114	108	7783699
GR0824-A30	L1: 4" grey cove base L2: Tan mastic used to adhere the cove base to substrate	South wall of Language Arts 160 at "nook" for ductwork	110	7783699
GR0824-A31	L1: Mixture of sticky translucent yellowish carpet mastic and grey floor leveling compound L2: Black tarry oakum-like expansion joint material in concrete floor slab	South side of Language Arts 160 at "nook" for ductwork	111	7783700
GR0824-A32	L1: Semi-pliable white sealant used between the metal return air duct and an access cover on the duct	South side of Language Arts 160	112	
GR0824-A33	L1: Pliable dark grey sealant used on the seams of newer ductwork and HVAC system components	South side of Language Arts 160	113	
GR0824-A34	L1: Pliable dark grey sealant used on the seams of newer ductwork and HVAC system components	West side of Language Arts 160	114	7783700
GR0824-A35	L1: Pliable dark grey sealant used on the seams of newer ductwork and HVAC system components	Northwest corner of Social Studies 163	115	

2024-13-PLM-COC



CHAIN OF CUSTODY

003750926

11471 Business Blvd., #773442
Eagle River, Alaska 99577
(907)-917-3801

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE LOCATION	PHOTO REFERENCE	LAB SAMPLE ID
GR0824-A36	L1: Semi-pliable white sealant used between a supply air duct penetration thru a gypsum board wall	Northwest corner of Social Studies 163	115	
GR0824-A37	L1: White gypsum board	Northwest corner of Social Studies 163	115	
GR0824-A38	L1: White joint compound	Above door frame at the northwest corner of Social Studies 163	116	
--END--				



9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: HTRW, LLC	Report Date: 8/27/2024
11471 Business Blvd., #773442	Report No.: 704042 - TEM NOB
Anchorage AK 99577	Project: Gruening MS
Client: HTR114	Project No.: 3750926

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7783697	Facility:	Organic Fraction: 89.8 %
Client No.: GR0824-A21	Location:	Gravimetrically Reduced Subsample: 10.2%
Description: Gray Sealant		
<u>% Asbestos Detected:</u>	<u>% Non-Asbestos Fibrous Material:</u>	<u>% Non-Fibrous Material:</u>
<i>None Detected</i>	Trace SiAl, Other Fiber	10.2 Other

Lab No.: 7783698	Facility:	Organic Fraction: 46.5 %
Client No.: GR0824-A29	Location:	Gravimetrically Reduced Subsample: 53.5%
Description: Brown Mastic		
<u>% Asbestos Detected:</u>	<u>% Non-Asbestos Fibrous Material:</u>	<u>% Non-Fibrous Material:</u>
<i>Trace Chrysotile, Detected at <0.25%</i>	None Detected	53.5 Other

Lab No.: 7783699	Facility:	Organic Fraction: 40.4 %
Client No.: GR0824-A30	Location:	Gravimetrically Reduced Subsample: 59.6%
Description: Tan Mastic		
<u>% Asbestos Detected:</u>	<u>% Non-Asbestos Fibrous Material:</u>	<u>% Non-Fibrous Material:</u>
<i>None Detected</i>	Trace SiAl, Other Fiber	59.6 Other

Lab No.: 7783700	Facility:	Organic Fraction: 96.0 %
Client No.: GR0824-A32	Location:	Gravimetrically Reduced Subsample: 4.0%
Description: White Sealant		
<u>% Asbestos Detected:</u>	<u>% Non-Asbestos Fibrous Material:</u>	<u>% Non-Fibrous Material:</u>
<i>None Detected</i>	0.2 SiAl, Other Fiber	3.8 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received:	8/23/2024
Date Analyzed:	08/27/2024
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: 8/27/2024 Report No.: 704042 - TEM NOB Project: Gruening MS Project No.: 3750926
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.

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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.



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Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: HTRW, LLC	Report Date: 8/27/2024
11471 Business Blvd., #773442	Report No.: 704042 - TEM NOB
Anchorage AK 99577	Project: Gruening MS
Client: HTR114	Project No.: 3750926

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.

HAZARDOUS MATERIALS ASSESSMENT

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: 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 on ISO/IEC 17025).*

2024-07-01 through 2025-06-30

Effective Dates



A handwritten signature in blue ink, reading "Dana S. Laman".

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.eurofins.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', is positioned above a horizontal line.

For the National Voluntary Laboratory Accreditation Program

HAZARDOUS MATERIALS ASSESSMENT

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:

HAZARDOUS MATERIALS ASSESSMENT

Appendix B - Lead

HAZARDOUS MATERIALS ASSESSMENT

Appendix B.1 – Table of XRF Readings

SciApps X-550, Serial No. 00528

RESULTS OF XRF TESTING

HTRW, LLC, Christopher T. Ottosen

August 13, 2024

READING NUMBER	FLOOR	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	Lead (Pb) mg/cm2	+/- ERROR
L01	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	1.041	0.033
L02	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	1.005	0.033
L03	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	0.974	0.032
L04	-	-	AUTOMATICALLY GENERATED AVERAGE OF CALIBRATION CHECK RESULTS	WOOD	RED	INTACT	1.007	0.019
L05	SECOND	BOILER ROOM 228	WALL	GYPSUM BOARD	OFF-WHITE	INTACT	-0.001	0.001
L06	SECOND	BOILER ROOM 228	WALL	CONCRETE BLOCK	BEIGE	INTACT	0.002	0.001
L07	SECOND	BOILER ROOM 228	DOOR FRAME	METAL	GREY	INTACT	0.002	0.001
L08	SECOND	BOILER ROOM 228	DOOR	METAL	GREY	INTACT	0.006	0.003
L09	SECOND	BOILER ROOM 228	KICKPLATE ON DOOR	METAL	BLACK	INTACT	0.002	0.001
L10	SECOND	BOILER ROOM 228	SUPPLY AIR DUCT	METAL	BLUE	INTACT	0.009	0.004
L11	SECOND	BOILER ROOM 228	HOT WATER TANK	POLYMER	BLUE	INTACT	-0.001	0.001
L12	SECOND	BOILER ROOM 228	SOLDER ON BLOWOFF VALVE PIPE	METAL	SILVER	INTACT	0.003	0.001
L13	SECOND	BOILER ROOM 228	PIPE INSULATION ON HEATING WATER SUPPLY	PAPER ON FIBERGLASS	GREEN	INTACT	0.002	0.001
L14	SECOND	BOILER ROOM 228	PIPE ELBOW COVER ON HEATING WATER SUPPLY	POLYMER	GREEN	INTACT	0.000	0.001
L15	SECOND	BOILER ROOM 228	PIPE INSULATION ON HEATING WATER RETURN	PAPER ON FIBERGLASS	BLUE	INTACT	0.001	0.001
L16	SECOND	BOILER ROOM 228	PIPE ELBOW COVER ON HEATING WATER RETURN	POLYMER	BLUE	INTACT	0.001	0.001
L17	SECOND	BOILER ROOM 228	PIPE INSULATION ON DOMESTIC HOT WATER	PAPER ON FIBERGLASS	WHITE	INTACT	-0.002	0.001
L18	SECOND	BOILER ROOM 228	PIPE ELBOW COVER ON DOMESTIC HOT WATER	POLYMER	WHITE	INTACT	0.000	0.001
L19	SECOND	BOILER ROOM 228	PIPE INSULATION ON DOMESTIC HOT WATER	PAPER ON FIBERGLASS	MAUVE	INTACT	0.002	0.001
L20	SECOND	BOILER ROOM 228	PIPE ELBOW COVER ON DOMESTIC HOT WATER	POLYMER	MAUVE	INTACT	0.000	0.001
L21	SECOND	BOILER ROOM 228	PERIMETER "SKIRT" ON TOP OF HOUSEKEEPING PAD FOR HOT WATER HEATERS	METAL	BLACK	INTACT	0.002	0.001
L22	SECOND	BOILER ROOM 228	SIDE OF HOUSEKEEPING PAD	CONCRETE	LIGHT GREY	INTACT	0.019	0.015

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RESULTS OF XRF TESTING

HTRW, LLC, Christopher T. Ottosen

August 13, 2024

READING NUMBER	FLOOR	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	Lead (Pb) mg/cm2	+/- ERROR
L23	SECOND	BOILER ROOM 228	FLOOR	CONCRETE	LIGHT GREY	INTACT	0.007	0.005
L24	SECOND	BOILER ROOM 228	AIR CHARGE VALVE	METAL	RED	INTACT	0.002	0.001
L25	SECOND	BOILER ROOM 228	SMALL CONDUIT	METAL	BEIGE	INTACT	0.086	0.026
L26	SECOND	BOILER ROOM 228	LARGER CONDUIT	METAL	BEIGE	INTACT	0.055	0.013
L27	SECOND	BOILER ROOM 228	HANDRAIL	METAL	BLACK	INTACT	0.002	0.001
L28	SECOND	BOILER ROOM 228	FUEL OIL DAY TANK CHANNEL BOLTED TO FLOOR	METAL	LIGHT GREY	INTACT	0.001	0.001
L29	SECOND	BOILER ROOM 228	SIDE OF FUEL OIL DAY TANK	METAL	LIGHT GREY	INTACT	-0.001	0.001
L30	SECOND	BOILER ROOM 228	MIDDLE "TOP-BOX" ON FUEL OIL DAY TANK	METAL	BLUE	INTACT	0.000	0.001
L31	SECOND	BOILER ROOM 228	"SIMPLEX" BOX ON TOP OF FUEL OIL DAY TANK	METAL	WHITE	INTACT	0.000	0.001
L32	SECOND	BOILER ROOM 228	SOLDER ON FUEL OIL TO BOILER PIPE	METAL	SILVER	INTACT	0.000	0.001
L33	SECOND	BOILER ROOM 228	MOTOR HOUSING FOR PUMP ON HOT WATER SUPPLY FROM HOT WATER TANK 4	METAL	RED	INTACT	0.277	0.142
L34	SECOND	BOILER ROOM 228	PUMP HOUSING ON HOT WATER SUPPLY FROM HOT WATER TANK 4	METAL	RED	INTACT	0.001	0.002
L35	SECOND	BOILER ROOM 228	MOUNTING PANEL FOR DOMESTIC HOT WATER GAUGES	WOOD	OFF-WHITE	INTACT	0.000	0.001
L36	SECOND	BOILER ROOM 228	TOP OF BEAM FOR BOILER SUPPORT	METAL	YELLOW	INTACT	0.003	0.001
L37	SECOND	BOILER ROOM 228	SIDE OF BEAM FOR BOILER SUPPORT	METAL	LIGHT GREY	INTACT	0.005	0.003
L38	SECOND	BOILER ROOM 228	TUBE SUPPORT FROM GROUND TO LARGE HEATING WATER PIPE	METAL	BLACK	INTACT	0.000	0.002
L39	SECOND	BOILER ROOM 228	PIPE INSULATION ON LARGE HEATING WATER SUPPLY	PAPER ON FIBERGLASS	WHITE	INTACT	0.005	0.001
L40	SECOND	BOILER ROOM 228	PIPE INSULATION ON LARGE HEATING WATER SUPPLY	PAPER ON FIBERGLASS	GREEN	INTACT	0.001	0.001
L41	SECOND	BOILER ROOM 228	PIPE ELBOW COVER ON LARGE HEATING WATER SUPPLY	POLYMER	GREEN	INTACT	0.000	0.001
L42	SECOND	BOILER ROOM 228	LARGE VALVE ON HEATING WATER SUPPLY ABOVE BOILER #3	METAL	GREEN	INTACT	0.005	0.002
L43	SECOND	BOILER ROOM 228	HANDWHEEL OF LARGE VALVE ON HEATING WATER SUPPLY ABOVE BOILER #3	METAL	BLACK	INTACT	0.000	0.002
L44	SECOND	BOILER ROOM 228	BOILER #3 SHEET METAL COVER	METAL	LIGHT BLUE	INTACT	0.005	0.004

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RESULTS OF XRF TESTING

HTRW, LLC, Christopher T. Ottosen

August 13, 2024

READING NUMBER	FLOOR	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	Lead (Pb) mg/cm2	+/- ERROR
L45	SECOND	BOILER ROOM 228	BOILER #3 BURNER FLANGE TO BOILER BODY ADAPTER PLATE	METAL	BLACK	INTACT	0.087	0.010
L46	SECOND	BOILER ROOM 228	BOILER #3 BURNER CONTROL HOUSING	METAL	BLUE	INTACT	0.002	0.002
L47	SECOND	BOILER ROOM 228	BOILER #3 BURNER FAN CASING	METAL	BLUE	INTACT	-0.002	0.001
L48	SECOND	BOILER ROOM 228	BOILER #3 BURNER MOTOR HOUSING	METAL	BLACK	INTACT	-0.001	0.001
L49	SECOND	BOILER ROOM 228	BOILER #3 BURNER FAN TUBE TO BURNER FLANGE ADAPTER PLATE	METAL	BLUE	INTACT	-0.003	0.001
L50	SECOND	BOILER ROOM 228	LOW WATER CUTOFF PIPE	METAL	BLACK	INTACT	0.001	0.002
L51	SECOND	BOILER ROOM 228	LOW WATER CUTOFF VALVE	METAL	BLACK	INTACT	0.002	0.001
L52	SECOND	BOILER ROOM 228	SQUARE D ELECTRICAL ENCLOSURE FOR BOILER #3	METAL	LIGHT GREY	INTACT	-0.002	0.002
L53	SECOND	BOILER ROOM 228	NATURAL GAS PIPE	METAL	BLUE	INTACT	-0.002	0.001
L54	SECOND	BOILER ROOM 228	VALVE ON NATURAL GAS PIPING	METAL	BLUE	INTACT	0.066	0.063
L55	SECOND	BOILER ROOM 228	TOP OF GLYCOL TANK LID	METAL	GREEN	INTACT	0.000	0.001
L56	SECOND	BOILER ROOM 228	BOILER INSPECTION COVER ON BACK OF BOILER	METAL	BLACK	INTACT	-0.004	0.002
L57	SECOND	BOILER ROOM 228	WALL	GYPSUM BOARD	BLUE	INTACT	0.001	0.001
L58	SECOND	BOILER ROOM 228	WALL	GYPSUM BOARD	WHITE	INTACT	0.001	0.001
L59	SECOND	BOILER ROOM 228	SMALL EXPANSION TANK "ET-2"	METAL	GREY	INTACT	0.000	0.001
L60	SECOND	BOILER ROOM 228	LARGE EXPANSION TANK "ET-1"	METAL	GREEN	INTACT	0.002	0.001
L61	SECOND	BOILER ROOM 228	ANGLE BOLTED TO FLOOR HOLDING DOWN LARGE EXPANSION TANK "ET-2"	METAL	GREEN	INTACT	-0.001	0.001
L62	SECOND	BOILER ROOM 228	SQUARE TUBE STRUCTURAL SUPPORT FOR HEATING GLYCOL SUPPLY EXPANSION TANK	METAL	BLACK	INTACT	-0.002	0.002
L63	SECOND	BOILER ROOM 228	BASE OF HEATING GLYCOL SUPPLY EXPANSION TANK	METAL	BROWN-RED	INTACT	0.003	0.002
L64	SECOND	BOILER ROOM 228	OUTLET FLANGE ON SIDE OF HEATING GLYCOL SUPPLY EXPANSION TANK	METAL	BROWN-RED	INTACT	0.000	0.002
L65	SECOND	BOILER ROOM 228	VALVE ON HEATING HOT WATER SUPPLY	METAL	RED	INTACT	0.001	0.001
L66	SECOND	BOILER ROOM 228	PIPE FLANGE ON HEATING HOT WATER SUPPLY	METAL	BLACK	INTACT	0.003	0.001

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RESULTS OF XRF TESTING

HTRW, LLC, Christopher T. Ottosen

August 13, 2024

READING NUMBER	FLOOR	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	Lead (Pb) mg/cm2	+/- ERROR
L67	SECOND	BOILER ROOM 228	VALVE ON HEATING HOT WATER SUPPLY	METAL	DARK GREEN	INTACT	0.000	0.001
L68	SECOND	BOILER ROOM 228	PIPE BEND ON HEATING HOT WATER SUPPLY	METAL	DARK BLUE	INTACT	0.000	0.002
L69	SECOND	BOILER ROOM 228	PUMP CASING ON HEATING HOT WATER SUPPLY	METAL	GREEN	INTACT	0.250	0.165
L70	SECOND	BOILER ROOM 228	MOTOR HOUSING ON HEATING HOT WATER SUPPLY	METAL	GREEN	INTACT	0.000	0.001
L71	SECOND	BOILER ROOM 228	PIPE BEND ON HEATING HOT WATER SUPPLY	METAL	BLACK	INTACT	0.144	0.013
L72	SECOND	BOILER ROOM 228	VALVE ON HEATING HOT WATER SUPPLY	METAL	BLACK	INTACT	0.000	0.001
L73	SECOND	BOILER ROOM 228	TUBE SUPPORT FROM GROUND TO HEATING WATER SUPPLY AIR SEPARATOR	METAL	BLACK	INTACT	0.002	0.002
L74	SECOND	BOILER ROOM 228	SIDE OF HEATING WATER SUPPLY AIR SEPARATOR	METAL	BROWN-RED	INTACT	0.003	0.002
L75	SECOND	BOILER ROOM 228	BLIND FLANGE ON SIDE OF HEATING WATER SUPPLY AIR SEPARATOR	METAL	BROWN-RED	INTACT	0.007	0.006
L76	SECOND	BOILER ROOM 228	SUPPLY AIR DUCT	METAL	BLUE	INTACT	0.021	0.007
L77	SECOND	BOILER ROOM 228	SOLDER ON DRAIN PIPE ON BACK OF BOILER #1	METAL	SILVER	INTACT	0.001	0.001
L78	SECOND	BOILER ROOM 228	SOLDER ON SMALL PIPE ON TOP OF THE SMALL NATURAL GAS DIAPHRAGM ON THE FRONT OF BOILER #1	METAL	SILVER	INTACT	1.826	0.056
L79	SECOND	BOILER ROOM 228	SOLDER ON PIPE ABOVE THE NATURAL GAS FLUID POWER GAS VALVE ON BOILER #1	METAL	SILVER	INTACT	2.201	0.059
L80	SECOND	BOILER ROOM 228	TOP OF BEAM FOR BOILER SUPPORT	METAL	YELLOW	INTACT	0.025	0.006
L81	SECOND	BOILER ROOM 228	SIDE OF BEAM FOR BOILER SUPPORT	METAL	YELLOW	INTACT	0.004	0.003
L82	SECOND	BOILER ROOM 228	FLOOR	CONCRETE	LIGHT GREY	INTACT	0.002	0.001
L83	SECOND	BOILER ROOM 228	MOUNTING PANEL ON WALL	WOOD	WHITE	INTACT	0.000	0.001
L84	SECOND	BOILER ROOM 228	BEAM	WOOD	BLACK	INTACT	0.001	0.001
L85	SECOND	BOILER ROOM 228	ALLTHREAD HANGAR FOR PIPE SUPPORT	METAL	BLACK	INTACT	0.000	0.001
L86	SECOND	BOILER ROOM 228	UNISTRUT PIPE HANGAR	METAL	BLACK	INTACT	0.002	0.001
L87	SECOND	BOILER ROOM 228	PIPE INSULATION ON DOMESTIC HOT WATER CIRCULATION PIPING	PAPER ON FIBERGLASS	PURPLE	INTACT	0.000	0.001
L88	SECOND	BOILER ROOM 228	PIPE ELBOW COVER ON DOMESTIC HOT WATER CIRCULATION PIPING	POLYMER	PURPLE	INTACT	0.001	0.001

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L89	SECOND	BOILER ROOM 228	WALL	GYPSUM BOARD	WHITE	INTACT	0.001	0.001
L90	SECOND	BOILER ROOM 228	PIPE INSULATION ON DOMESTIC WATER SUPPLY MAIN	PAPER ON FIBERGLASS	BLUE	INTACT	0.000	0.001
L91	SECOND	BOILER ROOM 228	PIPE CLAMP ON DOMESTIC WATER SUPPLY MAIN	METAL	RED	RUSTING	0.262	0.037
L92	SECOND	BOILER ROOM 228	"TEE" ON DOMESTIC WATER SUPPLY MAIN	METAL	GREY	RUSTING	0.367	0.020
L93	SECOND	BOILER ROOM 228	FLANGE ON DOMESTIC WATER SUPPLY MAIN	METAL	RED	RUSTING	0.290	0.018
L94	SECOND	BOILER ROOM 228	VALVE ON DOMESTIC WATER SUPPLY MAIN	METAL	LIGHT BLUE	RUSTING	0.000	0.002
L95	SECOND	BOILER ROOM 228	HANDWHEEL FOR VALVE ON DOMESTIC WATER SUPPLY MAIN	METAL	BLACK	RUSTING	0.004	0.002
L96	SECOND	BOILER ROOM 228	UNISTRUT PIPE SUPPORT	METAL	BLACK	RUSTING	0.021	0.006
L97	SECOND	BOILER ROOM 228	PIPE CLAMP ON DOMESTIC WATER SUPPLY MAIN	METAL	RED	RUSTING	0.007	0.006
L98	SECOND	BOILER ROOM 228	FLANGE ON DOMESTIC WATER SUPPLY MAIN	POLYMER	GREY	INTACT	0.000	0.001
L99	SECOND	BOILER ROOM 228	DOMESTIC WATER SUPPLY MAIN PIPE	POLYMER	GREY	INTACT	0.000	0.001
L100	SECOND	BOILER ROOM 228	"TEE" ON DOMESTIC WATER SUPPLY MAIN	POLYMER	GREY	INTACT	0.001	0.001
L101	SECOND	BOILER ROOM 228	FLANGE ON DOMESTIC WATER SUPPLY MAIN	METAL	ORANGE	RUSTING	1.123	0.036
L102	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	0.994	0.032
L103	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	1.037	0.034
L104	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	1.016	0.033
L105	SECOND	CORRIDOR	MAIN SUPPLY AIR DUCT	METAL	WHITE	INTACT	0.013	0.008
L106	SECOND	CORRIDOR	BRANCH ON SUPPLY AIR DUCT	METAL	WHITE	INTACT	0.019	0.009
L107	SECOND	CORRIDOR	RECTANGULAR SUPPLY AIR DUCT AT WALL PENETRATION	METAL	WHITE	INTACT	0.002	0.001
L108	SECOND	CORRIDOR	CHANNEL AT BOTTOM OF RECTANGULAR SUPPLY AIR DUCT	METAL	WHITE	INTACT	0.000	0.001
L109	SECOND	CORRIDOR	WALL	CONCRETE BLOCK	WHITE	INTACT	0.002	0.001
L110	FIRST	WORLD LANGUAGE 101	SLIDING DOOR IN UPPER CABINETRY	POLYMER	WHITE	INTACT	0.000	0.001

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RESULTS OF XRF TESTING

HTRW, LLC, Christopher T. Ottosen

August 13, 2024

READING NUMBER	FLOOR	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	Lead (Pb) mg/cm2	+/- ERROR
L111	FIRST	WORLD LANGUAGE 101	BOTTOM SHELF IN UPPER CABINETRY	WOOD	WHITE	INTACT	0.000	0.001
L112	FIRST	WORLD LANGUAGE 101	BACK SURFACE OF UPPER CABINETRY	WOOD	WHITE	INTACT	0.000	0.001
L113	FIRST	WORLD LANGUAGE 101	VERTICAL STRIP ON EDGES OF CABINET PIECES	POLYMER	WHITE	INTACT	0.000	0.001
L114	FIRST	WORLD LANGUAGE 101	COUNTERTOP	COMPOSITE	LIGHT GREY	INTACT	0.000	0.001
L115	FIRST	WORLD LANGUAGE 101	LOWER CABINET DOOR	WOOD	WOOD-GRAIN	INTACT	0.001	0.001
L116	FIRST	WORLD LANGUAGE 101	SHELF IN LOWER CABINET	WOOD	WHITE	INTACT	-0.001	0.001
L117	FIRST	WORLD LANGUAGE 101	BACK SURFACE OF BOTTOM CABINET	WOOD	WHITE	INTACT	0.000	0.001
L118	FIRST	WORLD LANGUAGE 101	VERTICAL STRIP ON EDGES OF CABINET PIECES	POLYMER	WOOD-GRAIN	INTACT	0.001	0.001
L119	FIRST	WORLD LANGUAGE 101	WALL	GYPSUM BOARD	WHITE	INTACT	-0.001	0.001
L120	FIRST	WORLD LANGUAGE 101	WALL	GYPSUM BOARD	GREY	INTACT	0.000	0.001
L121	FIRST	WORLD LANGUAGE 101	COVE BASE	POLYMER	GREY	INTACT	0.000	0.001
L122	FIRST	WORLD LANGUAGE 101	CARPET SQUARE	CARPET	GREY	INTACT	0.001	0.001
L123	FIRST	WORLD LANGUAGE 101	TACKBOARD	CORK	GREY	INTACT	0.000	0.001
L124	FIRST	WORLD LANGUAGE 101	WALL PANEL	TECTUM	GREY	INTACT	0.000	0.001
L125	FIRST	OFFICE 101A	WALL	GYPSUM BOARD	WHITE	INTACT	0.000	0.001
L126	FIRST	STORAGE 114	CEILING	GYPSUM BOARD	WHITE	INTACT	0.001	0.001
L127	FIRST	STORAGE 114	SOFFIT	GYPSUM BOARD	WHITE	INTACT	0.001	0.001
L128	FIRST	STORAGE 114	WALL	GYPSUM BOARD	WHITE	INTACT	0.000	0.001
L129	FIRST	STORAGE 114	FINTUBE ENCLOSURE	METAL	BROWN	INTACT	0.001	0.001
L130	FIRST	STORAGE 114	WALL	GYPSUM BOARD	WHITE	INTACT	0.001	0.001
L131	FIRST	STORAGE 114	WALL	CONCRETE BLOCK	WHITE	INTACT	0.000	0.001
L132	FIRST	LANGUAGE ARTS 160	RETURN AIR DUCT	METAL	WHITE	INTACT	0.001	0.001

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L133	FIRST	LANGUAGE ARTS 160	SUPPLY AIR DUCT	METAL	WHITE	INTACT	0.001	0.001
L134	FIRST	LANGUAGE ARTS 160	SOFFIT	GYPSUM BOARD	WHITE	INTACT	0.000	0.001
L135	FIRST	LANGUAGE ARTS 160	WALL	GYPSUM BOARD	WHITE	INTACT	0.001	0.001
L136	FIRST	LANGUAGE ARTS 160	WALL	GYPSUM BOARD	WHITE	INTACT	0.000	0.001
L137	FIRST	LANGUAGE ARTS 160	SUPPLY AIR DUCT	METAL	WHITE	INTACT	-0.001	0.001
L138	FIRST	LANGUAGE ARTS 160	SUPPLY AIR DUCT BRANCH FOR DIFFUSER	METAL	WHITE	INTACT	0.000	0.001
L139	FIRST	LANGUAGE ARTS 160	SUPPLY AIR DUCT DIFFUSER COVER	METAL	WHITE	INTACT	0.000	0.001
L140	FIRST	SOCIAL STUDIES 163	SUPPLY AIR DUCT	METAL	WHITE	INTACT	0.000	0.001
L141	FIRST	SOCIAL STUDIES 163	WALL	GYPSUM BOARD	GREY	INTACT	0.000	0.001
L142	FIRST	OFFICE 163A	WALL	GYPSUM BOARD	WHITE	INTACT	0.000	0.001
L143	FIRST	OFFICE 163A	DIFFUSER AT END OF SUPPLY AIR DUCT	METAL	WHITE	INTACT	0.000	0.001
L144	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	0.982	0.032
L145	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	1.017	0.033
L146	-	-	CALIBRATION CHECK, SRM 2573	WOOD	RED	INTACT	1.012	0.033

- 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).

HAZARDOUS MATERIALS ASSESSMENT

Appendix B.2 – Lead Inspector Certifications



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

February 27, 2024

Christopher Ottosen

17531 Toakoana Dr
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, you are certified as an **EPA Risk Assessor in All EPA Administered States, Tribes, and Territories**. Your certificate is enclosed and serves as your proof of certification (Please note: EPA no longer issues individual identification cards for certified individuals).

This certification **expires on September 29, 2027 and is valid in All EPA Administered States, Tribes, and Territories**. However, if any State, Territory, or Indian Tribe obtains program authorization at any time during the term of your accreditation, your certification will no longer be valid in the newly authorized jurisdiction.

Your EPA individual certification is subject to the following:

- 1) Certification pertains only to the specific discipline, jurisdiction, and individual listed above that performs or offers to perform the associated lead-based paint activities within the scope of the discipline described in 40 CFR 745.223 and 40 CFR 745.227 pursuant to Section 402 of the Toxic Substances Control Act (TSCA)(15 U.S.C. 2682).
- 2) EPA certification does not mean that a State, Territory or Indian Tribe with its own certification program must accept or recognize an EPA certification. Individual States, Territories, and Indian Tribes, whether authorized or not, have the right to accept or reject any certification under their own authority. Please be aware that your EPA certification does not relieve you of any obligations that you may otherwise have to any authorized or unauthorized State, Territory, or Indian Tribe to obtain licensure or certification from that State or Indian Tribe under its statutory or regulatory requirements relating to lead-based paint activities.
- 3) The EPA may conduct audits and/or inspections to ensure continued compliance with its regulatory standards.

If you have questions or need assistance, please contact the Regional Lead Coordinator, Angela Baranco, of the EPA Region 9 staff at baranco.angela@epa.gov and refer to **Application ID number I909310**. Congratulations, and thank you for your interest in being certified to conduct lead-based paint services.

Sincerely,

A handwritten signature in black ink, appearing to read "Adrienne Priselac", is placed above the typed name.

Adrienne Priselac, Manager, Toxics Office
Land Division

Enclosures

Internet Address (URL) • <http://www.epa.gov>
Recycled/Recyclable • Printed with Vegetable Oil Based Inks on 100% Postconsumer, Process Chlorine Free Recycled Paper

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, appearing to read "Michelle Price", is written over a light blue horizontal line.

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

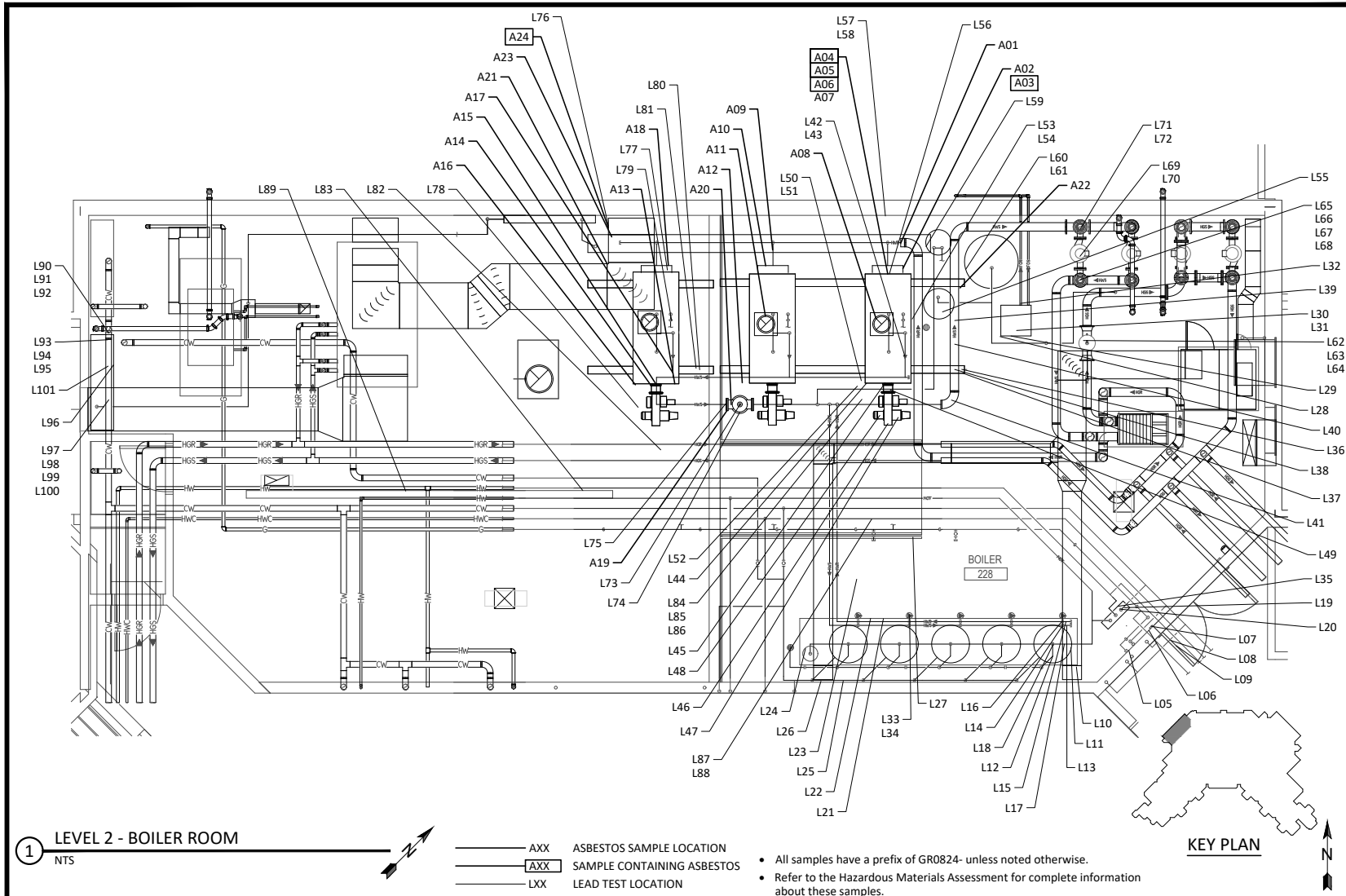
Lead, Heavy Metals, and Inorganics Branch

HAZARDOUS MATERIALS ASSESSMENT

**Appendix C – Other Common Hazardous Building
Materials (no sampling of these materials was
performed)**

HAZARDOUS MATERIALS ASSESSMENT

Appendix D – Drawings of Asbestos and Lead Test Locations

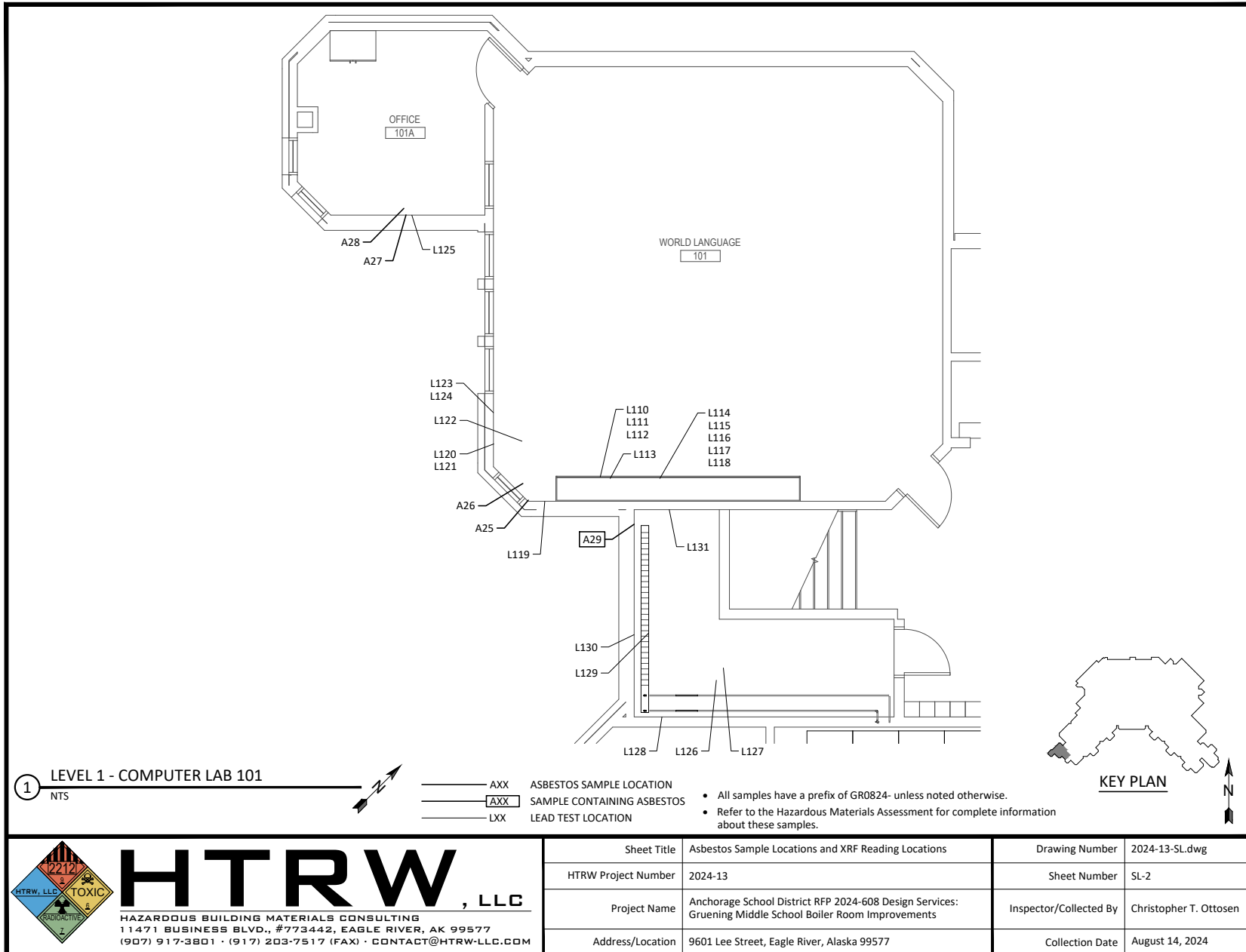




HTRW, LLC

HAZARDOUS BUILDING MATERIALS CONSULTING
11471 BUSINESS BLVD., #773442, EAGLE RIVER, AK 99577
(907) 917-3801 • (917) 203-7517 (FAX) • CONTACT@HTRW-LLC.COM

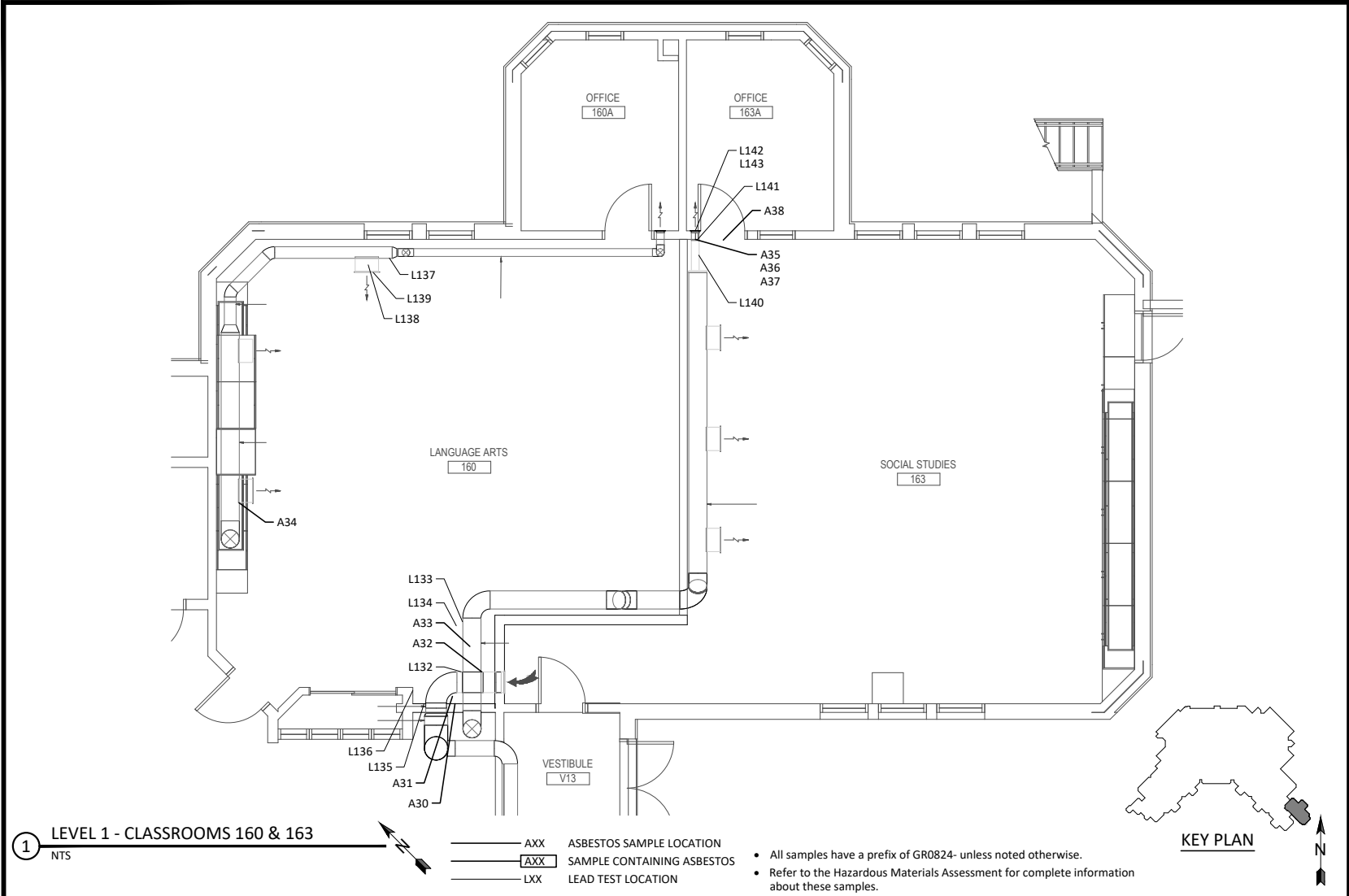
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HTRW Project Number	2024-13	Sheet Number	SL-1
Project Name	Anchorage School District RFP 2024-608 Design Services: Gruening Middle School Boiler Room Improvements	Inspector/Collected By	Christopher T. Ottosen
Address/Location	9601 Lee Street, Eagle River, Alaska 99577	Collection Date	August 14, 2024



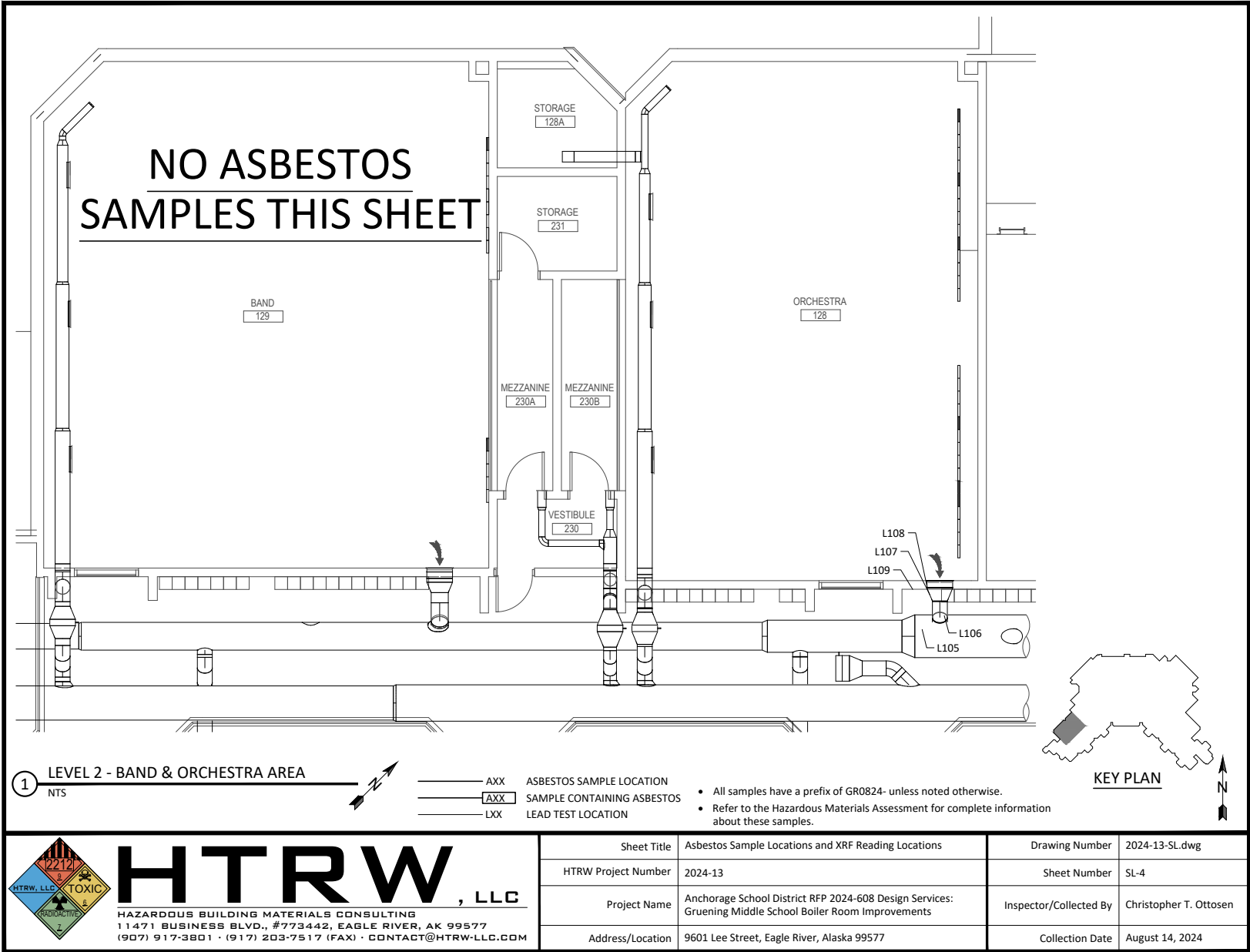
HTRW, LLC

HAZARDOUS BUILDING MATERIALS CONSULTING
11471 BUSINESS BLVD., #773442, EAGLE RIVER, AK 99577
(907) 917-3801 • (917) 203-7517 (FAX) • CONTACT@HTRW-LLC.COM

Sheet Title	Asbestos Sample Locations and XRF Reading Locations	Drawing Number	2024-13-SL.dwg
HTRW Project Number	2024-13	Sheet Number	SL-2
Project Name	Anchorage School District RFP 2024-608 Design Services: Gruening Middle School Boiler Room Improvements	Inspector/Collected By	Christopher T. Ottosen
Address/Location	9601 Lee Street, Eagle River, Alaska 99577	Collection Date	August 14, 2024



 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	Sheet Title	Asbestos Sample Locations and XRF Reading Locations	Drawing Number	2024-13-SL.dwg
	HTRW Project Number	2024-13	Sheet Number	SL-3
	Project Name	Anchorage School District RFP 2024-608 Design Services: Gruening Middle School Boiler Room Improvements	Inspector/Collected By	Christopher T. Ottosen
	Address/Location	9601 Lee Street, Eagle River, Alaska 99577	Collection Date	August 14, 2024



HAZARDOUS MATERIALS ASSESSMENT

Appendix E – Supplemental Information

2024/08/13

Hazardous Materials Assessment



(Photo 73; 2024-08-13 13:21)



(Photo 74; 2024-08-13 13:21)



(Photo 75; 2024-08-13 13:22)



(Photo 76; 2024-08-13 13:35)

2024/08/13

Hazardous Materials Assessment



(Photo 77; 2024-08-13 13:36)



(Photo 78; 2024-08-13 13:36)



(Photo 79; 2024-08-13 13:38)



(Photo 80; 2024-08-13 13:39)

2024/08/13

Hazardous Materials Assessment



(Photo 81; 2024-08-13 13:44)



(Photo 82; 2024-08-13 13:44)



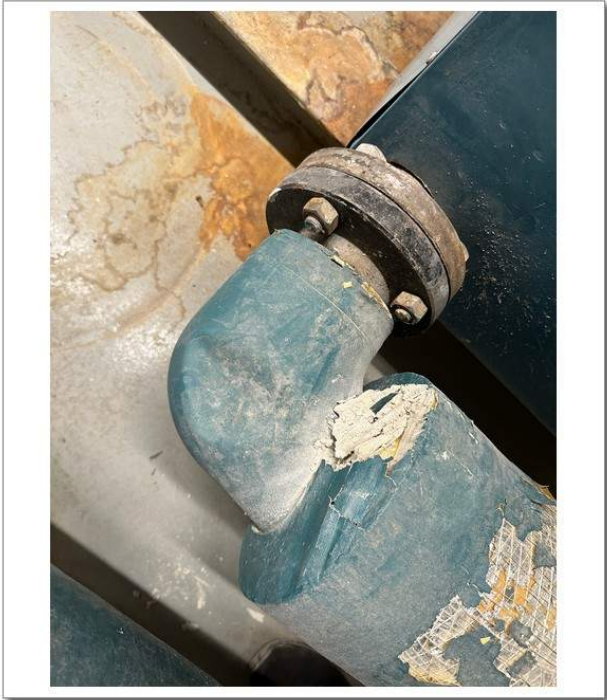
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(Photo 84; 2024-08-13 13:51)

2024/08/13

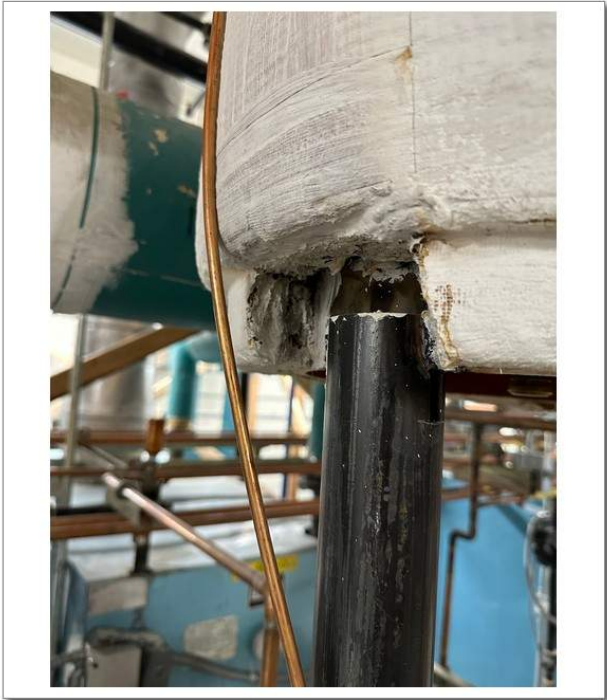
Hazardous Materials Assessment



(Photo 85; 2024-08-13 13:52)



(Photo 88; 2024-08-13 13:55)



(Photo 89; 2024-08-13 13:56)



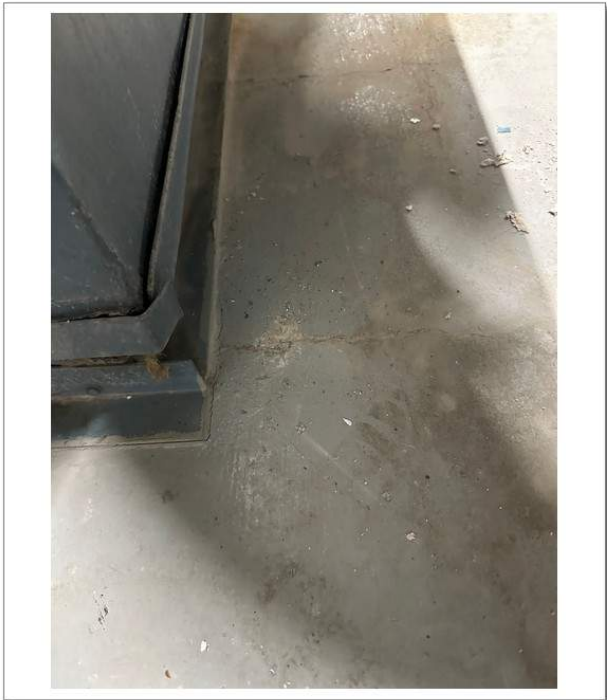
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2024/08/13

Hazardous Materials Assessment



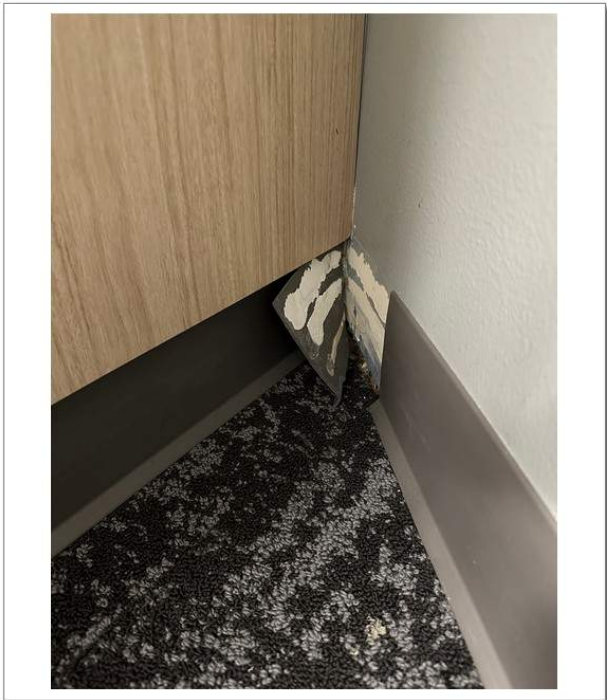
(Photo 91; 2024-08-13 14:15)



(Photo 92; 2024-08-13 14:17)



(Photo 93; 2024-08-13 14:18)



(Photo 104; 2024-08-13 14:57)

2024/08/13

Hazardous Materials Assessment



{Photo 105; 2024-08-13 15:00}



{Photo 106; 2024-08-13 15:02}



{Photo 107; 2024-08-13 15:03}



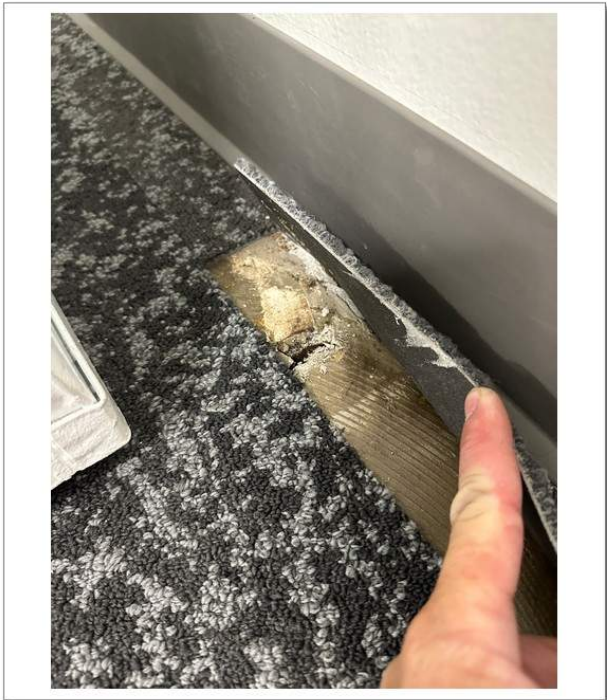
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2024/08/13

Hazardous Materials Assessment



{Photo 110; 2024-08-13 15:28}



{Photo 111; 2024-08-13 15:30}



{Photo 112; 2024-08-13 15:48}



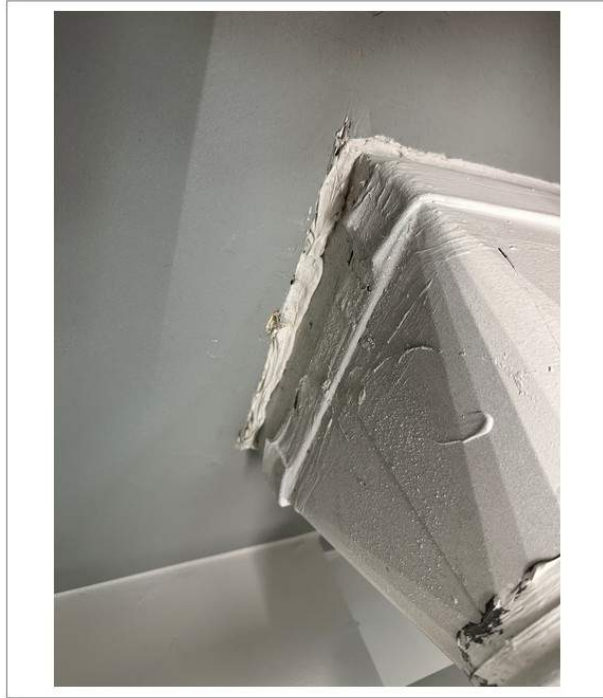
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2024/08/13

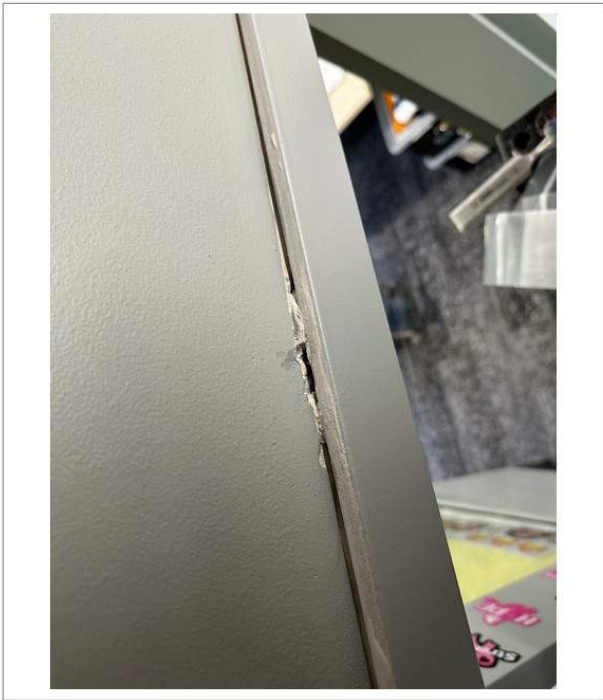
Hazardous Materials Assessment



(Photo 114; 2024-08-13 15:50)



(Photo 115; 2024-08-13 15:57)



(Photo 116; 2024-08-13 15:58)

END OF SECTION

END OF SECTION

SELECTIVE BUILDING DEMOLITION

PART 1. GENERAL

1.1 NOTIFICATION

- 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 RELATED SECTIONS

- A. Division 1 – General Requirements
- B. Section 02 26 00 – Hazardous Materials Assessment
- C. Section 02 89 00 – Minor Hazardous Materials Related Work

1.3 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.

1.4 APPLICABLE PUBLICATIONS

- A. International Building Code (IBC) Section 3302 – Construction Safeguards: Exit Maintenance and Fire Safety.

1.5 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 prior to 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 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 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 prior to demolition.

1.6 QUALITY ASSURANCE

- A. Demolition firm qualifications: Company with at least 5 successful completed demolition work projects similar to this project.
- B. Regulatory requirements: Comply with governing authorities before starting demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.7 PREDEMOLITION MEETING

- A. Meet with OWNER representative to review proposed schedule and sequence of work prior to start of work.

1.8 EXISTING CONDITIONS

- A. Conduct demolition to minimize interference with adjacent building and property areas. Maintain protected egress and access at all times.
- 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 OWNERS separate report and Hazmat DRAWINGS and follow approved removal and disposal procedures.

1.9 CONDITION OF STRUCTURES

- A. The OWNER assumes no responsibility for 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. Accuracy and completeness of these construction drawings is not guaranteed.

1.10 OWNER OCCUPANCY

- A. The OWNER will not be occupying the facility.

1.11 SALVAGE

- A. Items indicated to be demolished or removed but of salvable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.
- B. Storage or sale of removed items on site will not be permitted.

- C. Historic artifacts, including cornerstones and their contents, commemorative plaques and tablets, antiques, and other articles of historic significance remain the property of the OWNER. Notify the OWNER if such items are encountered and obtain acceptance regarding method of removal and salvage.
- D. Items indicated to be salvaged for OWNER'S reuse remain the OWNER'S property.

1.12 DAMAGES

- A. Promptly repair damages caused to adjacent facilities by demolition work at no cost to the OWNER.

1.13 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.

1.14 ENVIRONMENTAL CONTROLS

- A. Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.
 - 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding and pollution.

PART 2. PRODUCTS

2.1 BARRIER PARTITIONS

- A. Provide 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 integrity of dust controlling membrane.

2.2 PROTECTIVE RAILINGS

- A. Fabricate handrails-guardrails from wood, steel or other approved materials and anchor solidly to 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. Provide protection from demolition and exterior weather as necessary to prevent damage to existing finishes and equipment to remain.
- B. Provide engineered 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. Provide protection to allow safe passage of OWNER's personnel to occupied portions of existing building.

PART 3. EXECUTION

3.1 EXAMINATION

- A. Prior to commencement of demolition work, inspect areas in which work will be performed. Photograph existing conditions at adjacent structure surfaces, equipment or to surrounding properties, which could be damaged resulting from demolition work.
 - 1. Provide minimum 4 by 5 inch digital images showing complete record of existing building interior and exterior demolition areas and adjacent properties.
 - 2. Submit to OWNER prior to starting work.

3.2 PREPARATION

- A. Erect and maintain temporary barrier partitions to prevent spread of dust, fumes, noise, and smoke. Provide temporary barricades and other forms of protection as required to protect the OWNER'S personnel and 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 general public to and from occupied portions of building.
 - 2. Protect from damage existing finish work that is to remain in place and that becomes exposed during demolition operations.
 - 3. Provide temporary weather protection to insure that no water leakage or freeze damage occurs to structure or interior areas of existing building.
 - 4. Remove protections at completion of work.
- B. Protect existing items and site paving which 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 hours advance notice to OWNER if shut-down is necessary.
- E. Mark 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.
- C. Erect and maintain temporary partitions and closures to separate areas where noisy or dusty demolition operations are performed to prevent spread of excessive noise, dust or fumes to occupied portions of the building and to protect interior of 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.
 - 2. Use water misting to limit dust and dirt rising and scattering in air. Do not create hazardous or objectionable ice, flooding or pollution when using water. Verify use of water with OWNER.
- D. Perform demolition work in a systematic orderly manner. Use such methods as required to complete work indicated on drawings in accordance with 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 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 which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit 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. Contractor shall validate list below and establish the actual list including additional items.
 - 2. Shelving not reused in the Work.
 - 3. Doors, frames, and hardware not reused in the Work.
 - 4. Electrical devices (lights, power poles, etc.) not reused in the Work.
 - 5. Mechanical equipment (diffusers, mixing boxes, etc.) not reused in the Work.
 - 6. Toilet Accessories not reused in the Work.
 - 7. Protect in place other items as noted on the DRAWINGS.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove debris, rubbish and other materials resulting from demolition operations from 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 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 in excess of 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

MINOR HAZARDOUS MATERIALS RELATED WORK

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 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 SECTION INCLUDES

- A. This section applies to work involving the removal, disturbance, transportation, and disposal of minor or incidental quantities of asbestos-containing materials, lead-containing materials (including 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 the removal, disturbance, transportation, and disposal of larger quantities of asbestos-containing materials, lead-containing materials (including 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 such as would be found in a renovation or demolition.
- C. 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; 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.

1.03 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.

1.04 RELATED WORK

- A. 02 26 00 – Hazardous Materials Assessment

1.05 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 61.600-790 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
 - 11. 18 AAC 85 Radiation Protection
- 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
 - 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. 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
- U. United States Environmental Protection Agency (EPA)
 - 1. EPA 340/1-90/018 Asbestos/NESHAP Regulated Asbestos Containing Materials Guidance
 - 2. 40 CFR 61 National Emission Standards for Hazardous Air Pollutants
 - 3. 40 CFR 61-Subpart A General Provisions
 - 4. 40 CFR 61-Subpart M National Emission Standard for Asbestos
 - 5. 40 CFR 82 Protection of Stratospheric Ozone
 - 6. 40 CFR 124 Procedures for Decisionmaking
 - 7. 40 CFR Subchapter I Solid Wastes
 - 8. 40 CFR 260 Hazardous Waste Management System: General
 - 9. 40 CFR 261 Identification and Listing of Hazardous Waste
 - 10. 40 CFR 262 Standards Applicable to Generators of Hazardous Waste
 - 11. 40 CFR 263 Standards Applicable to Transporters of Hazardous Waste
 - 12. 40 CFR 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
 - 13. 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
 - 14. 40 CFR 266 Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
 - 15. 40 CFR 267 Standards for Owners and Operators of Hazardous Waste Facilities Operating Under a Standardized Permit
 - 16. 40 CFR 268 Land Disposal Restrictions
 - 17. 40 CFR 270 EPA Administered Permit Programs: The Hazardous Waste Permit Program
 - 18. 40 CFR 271 Requirements for Authorization of State Hazardous Waste Programs
 - 19. 40 CFR 272 Approved State Hazardous Waste Management Programs

20. 40 CFR 273 Standards for Universal Waste Management
21. 40 CFR 300 National Oil and Hazardous Substances Pollution Contingency Plan
22. 40 CFR 302 Designation, Reportable Quantities, and Notification
23. 40 CFR 745 Lead-Based Paint Poisoning Prevention in Certain Residential Structures
24. 40 CFR 761 Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
25. 40 CFR 763 Asbestos

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

1.06 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 and CPIH's employer must have no employee or employer relationship which could constitute a conflict of interest.

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: asbestos-containing, 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. Hazards Removal Contractor (HRC)

1. Hazards Removal Contractor (HRC) means the GC or other subcontractor(s) responsible for conducting the work required by this section.

H. 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 have no employee or employer relationship which could constitute a conflict of interest.

I. Main Work Area

1. Main Work Area is intended to include area(s) which have defined boundaries where the majority of work is located.

J. 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.

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.

1.07 QUALITY ASSURANCE

A. General

1. Administrative and supervisory personnel shall, at a minimum, consist of the HRC'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 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. HRC and GC Responsibility
 - a. The HRC shall assume primary responsibility and liability for compliance with all applicable federal, state, and local regulations related to all aspects of the 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 hazardous materials present in the work areas. The HRC 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 HRC 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 hazardous materials waste generated by the work covered by this section. The TDC's responsibilities include, but are not limited to, accurate identification and classification of the 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 lading, exception and discrepancy reports; and all other transportation and disposal documentation required by this section.

C. Site Conditions

1. The condition of the 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 HRC and GC must verify the accuracy of the conditions that are presented in the HMA, the hazards abatement design drawings and specifications, and the HRC's approved Hazards Abatement Plan (HAP).
2. The building may be occupied and in use during the work. The HRC 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 HRC and GC are jointly responsible for and must control access to the areas where hazardous materials removal work is being performed and areas where 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 hazardous materials to be removed and/or disturbed are shown in the HMA. 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 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 HRC 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 HRC and GC must document the locations and quantities of hazardous materials removed each day from each work area. Quantities of hazardous materials must match the units used on the hazards abatement drawings. Where, in the opinion of the HRC 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 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 HRC and GC must submit unit pricing within their bid for each hazardous materials 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 HRC 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 HRC 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 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 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 HRC and GC must immediately stop all 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 HRC and GC as soon as it is practicable. The HRC and GC must not resume any 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 hazardous materials removal work conditions/activities are not being performed within the requirements of this specification, the HRC's approved HAP, 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 HRC 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 HRC'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 HRC and GC must immediately stop hazardous materials removal removal/disturbance activities and initiate corrective actions 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. Mercury vapor concentrations exceed 600 ng/m³ outside of the regulated work area.
 - c. Breach or break in regulated area containment barrier(s).
 - d. Pressure within a Negative Pressure Enclosure falls below -0.02 inch WCG.
 - e. Serious injury/death at the site.
 - f. Fire/safety emergency at the site.

- g. Respiratory protection system failure.
- h. Power failure or loss or inadequate use of wetting agent.
- i. Any visible emissions observed outside the regulated area.
- j. Failure to follow project specification requirements.

H. Protection of Existing Work to Remain

- 1. The HRC 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 HRC 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 HRC 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 HRC 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.

1.08 REQUIREMENTS

A. Description of Work

- 1. The hazardous materials work of this project is anticipated to be minor in nature and incidental to the proposed Boiler Room Improvement Project. The following materials are anticipated to be disturbed by the work described under each

material:

- a. Removal and disposal of the boilers is anticipated to be performed using "intact" removal methods which will not require disturbance of the asbestos-containing gaskets or assumed asbestos-containing sealants and insulating materials. If performed using "intact" removal methods which do not require disturbance of asbestos-containing materials, the work would be classified as an unclassified asbestos abatement operation.
- b. Removal and disposal of asbestos-containing grey and green sealants on the ductwork is generally anticipated to be performed using "intact/wrap and cut" methods which will not require disturbance of the asbestos-containing sealants. However, the project may require direct removal of the sealants at connection points, particularly on ductwork in the Level 2 corridor outside of the Band and Orchestra areas, due to the large diameter of the duct and the configuration of the existing and new connections.
- c. Removal and disposal of asbestos-containing flange gaskets and valve packings is anticipated to be performed using "intact" removal methods which will not require disturbance of the asbestos-containing gaskets or assumed asbestos-containing valve packing materials. If performed using "intact" removal methods which do not require disturbance of asbestos-containing materials, the work would be classified as an unclassified asbestos abatement operation.
- d. Removal and disposal of remnant asbestos-containing roof mastics at the boiler flue curbs, if encountered, is anticipated to be performed using wet methods, HEPA vacuums, and prompt cleanup, however, the work is not subject to regulation by 29 CFR 1926.1101.
- e. Removal and disposal of the remnant dark brown cove base mastics which contain less than 1% asbestos is anticipated to be necessary in Language Arts 160 to accommodate the new wall construction. These mastics may also require disturbance inside of Storage 114 and the adjacent World Language 101 and Office 101A to accommodate the new mechanical elements.
- f. Removal and disposal of the glycol-based heat transfer fluids assumed to not be classified as a hazardous waste is anticipated to be performed by draining only the fluids necessary to accommodate the project. It is anticipated that the majority of the heat transfer fluids will be reused without treatment in the heating system. Small amounts of heat transfer fluids are anticipated to be left inside of boiler cavities, piping, tanks, and other miscellaneous equipment, and those fluids, along with any other heat transfer fluids, must be completely removed and recycled if they cannot be reused. Treatment of any type is specifically prohibited by this section unless testing is performed which demonstrates the heat transfer fluids are not classified as a hazardous waste or otherwise subject to regulated treatment activities.
- g. No mercury-containing equipment was identified during the hazmat assessment, however, some equipment may be discovered inside of various controls, switches, and other miscellaneous equipment scheduled for demolition. If discovered, the mercury-containing equipment is required to be managed as a universal waste in accordance with 40 CFR 273.
- h. Removal and disposal of the fuel oil lines, day tank, filters, and all associated appurtenances is anticipated to be performed by completely removing all residual fuel oils and recovering those fuel oils for proper disposal and or reuse. Any components that cannot be completely drained and/or cleaned such that no residual fuel oils remain must be disposed of in accordance with 40 CFR Subchapter I.

- i. The hazards abatement work of Additive Alternate #1 is anticipated to include only the removal and disposal of asbestos-containing flange gaskets and valve packings which is anticipated to be performed using "intact" removal methods which will not require disturbance of the asbestos-containing gaskets or assumed asbestos-containing valve packing materials. If performed using "intact" removal methods which do not require disturbance of asbestos-containing materials, the work would be classified as an unclassified asbestos abatement operation.
- j. For all asbestos work where the disturbance of the asbestos-containing materials cannot be avoided, and if that work cannot be contained within a single, standard sized, and unmodified glovebag, the work will be classified as a Class II asbestos abatement operation which is required by this section to be performed inside of critical barriers. All other disturbances are anticipated to be performed as a small-scale, short-duration operation.
- k. Disturbance of lead-containing paints as necessary to accommodate the project, such as for penetrations thru walls, ceilings, cabinetry, or other painted surfaces, or for painting and patching activities. This work may be regulated by 29 CFR 1926.62, however, it is the responsibility of the Contractor to determine the applicability of the regulation to their work and to ensure complete compliance with the requirements of that regulation.
- 2. The work includes all related submittals, monitoring, inspections, sampling, testing, removal, disturbance, transportation, disposal, recordkeeping, documentation, and other elements as specified herein.

1.09 LISTING OF REQUIRED SUBMITTALS

A. Preconstruction Submittals

- 1. Hazard Abatement Plan (HAP).
- 2. Employee training documentation.
- 3. Competent Person documentation.
- 4. Affidavit of Medical Surveillance, Respiratory Protection, and Training Accreditation.
- 5. License and insurance for the HRC.
- 6. CPIH documentation.
- 7. Testing laboratory documentation.
- 8. Documentation of notifications.
- 9. TDC documentation.
- 10. Waste transporter documentation.
- 11. Waste disposal site documentation.

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. Waste transport records.
- 2. Disposal site receipts.
- 3. Updates to any previously submitted submittals.

1.10 DETAILS OF REQUIRED PRECONSTRUCTION SUBMITTALS

A. Hazard Abatement Plan (HAP)

1. The Hazard Abatement Plan (HAP) must not be combined with other hazard abatement plans and must be prepared and signed by a State-accredited EPA Project Designer for asbestos work and by the HRC and/or GC and their Competent Person for all other work. 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 HRC which must include, but not be limited to, the following elements for each of the 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 hazardous material to be removed.
 - c. Estimated quantities of each hazardous material to be removed.
 - d. A pre-work sampling plan describing the procedures to be used to identify, sample, and quantify any additional 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 hazardous material to be removed.
 - i. Work area setup to be used for each type of hazardous material to be removed.
 - j. A description of the minimum training requirements for employees for each type of hazardous material to be removed.
 - k. Personal protective equipment to be used for each type of hazardous material to be removed.
 - l. Procedures for the decontamination of personnel for each type of hazardous material to be removed.
 - m. Removal procedures for each type of hazardous material to be removed.
 - n. Procedures to be used for the decontamination of existing building components for each type of hazardous material to be removed.
 - o. Expendable materials to be used during the removal of hazardous materials for each type of hazardous material to be removed.
 - p. Procedures to be used in the event 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 hazardous material to be removed.
 - t. Waste packaging, storage, loadout, decontamination, manifesting, transport, and disposal procedures.

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- u. Procedures to follow in the event additional quantities of hazardous materials are encountered after the start of work.
- v. Current copies of accreditations relevant to the 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 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 HRC'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 hazardous materials being removed are required to be performed within a regulated area.
 - c. Monitoring and sampling is required due to the type of hazardous material being removed.

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, all personnel performing work at this site are required to have a minimum of "two-hour asbestos awareness training". 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. All persons involved in the removal of the following 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 hazardous material:

- a. Removal of intact universal waste mercury-containing lamps, mercury-containing thermostats, or mercury-containing equipment.
 - 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.
6. In addition to the training required above, all persons involved in the removal and/or cleanup of the following 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.
7. 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.
8. 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.
9. 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.
10. 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.
11. Additional training related to health, safety, and environmental issues may be required, and it is the responsibility of the HRC, the HRC'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. All 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.

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 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 hazardous materials work:
 - a. Evidence of training on the contents of 29 CFR 1926.21; 29 CFR 1926.62; 29 CFR 1926.1101; 40 CFR 763, 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 HRC'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, 29 CFR 1926.62, 29 CFR 1926.1101, and other regulations required by this section and federal, state, or local agencies.

E. HRC License and Insurance

1. Submit a copy of the HRC'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 hazardous materials removal activities are covered by the policy.

F. Contractor's Professional Industrial Hygienist (CPIH)

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.
 - g. Evidence that the CPIH meets the employee training requirements of this section for each hazardous material affected by the project.
 - h. The CPIH and the HRC and GC must not have an employee/employer relationship or financial relationship which could constitute a conflict of interest.

G. Testing Laboratory

1. The minimum analytical capabilities required for the hazardous materials 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.
 - e. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 1110A – Corrosivity towards steel.
 - f. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 1311 – Toxicity Characteristic Leaching Procedure.
 - g. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 6010D – Inductively Coupled Plasma-Atomic Emission Spectrometry.
 - h. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 6020B – Inductively Coupled Plasma-Mass Spectrometry.
 - i. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 7000B – Flame Atomic Absorption Spectrophotometry.
 - j. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 7010 – Graphite Furnace Atomic Absorption Spectrophotometry.
 - k. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 7040A – Mercury in Liquid Waste (Manual Cold-Vapor Technique).
 - l. 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).
 - m. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Method 9040C – pH Electrometric Measurement.
 - n. NIOSH NMAM 5503 – Polychlorobiphenyls.
 - o. 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 "Asbestos Analyte Class" in the "Overall Performance Summary".

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- 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'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".
- f. 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).
- g. 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".
- h. The testing laboratory must be independent of the HRC and GC 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 HRC.
- 3. 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.

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- 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.
4. 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.
5. 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 hazardous materials removal work.
2. Submit evidence that the TDC meets the employee training requirements of this section for each hazardous material affected by the project.
3. The TDC and the GC and/or their subcontractors must not have an employee/employer relationship or financial relationship which could constitute a conflict of interest.

J. 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.
2. 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.
3. Submit written evidence that the transporter is approved to transport universal wastes in accordance with the requirements of 40 CFR 263 Subpart D.
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 is registered in accordance with 49 CFR 107 Subpart G, if required by 49 CFR 107.601.
5. 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 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.
3. Submit the following for each facility which will receive, handle, treat, store, accumulate, dispose of, recycle, or reclaim any of the 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.
4. 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.
5. Submit the following for each facility which will receive, handle, treat, store, accumulate, dispose of, recycle, or reclaim 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.
6. 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 flowing 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.

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- B. Work area inspections and clearances.

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- j. If the work area was not satisfactorily cleaned, indicate the deficiencies noted and the recommended corrective actions to be taken.
- k. 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.
- l. 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. Indicate whether encapsulant was used, and if so, indicate whether the encapsulant has dried to the touch.
 - 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 HRC'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 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.
 - 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. 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.
 - 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. All information described in 40 CFR 61.150(d).
2. For asbestos, disposal site receipts must include:
 - a. The name, address, and telephone number of the disposal site.
 - b. The date and time the asbestos wastes were received by the disposal site operator.
 - c. The name and signature of the disposal site operator's personnel who received the asbestos wastes.
 - d. A unique identifying number which can be traced to a waste shipment record.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.

8. 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.
 - 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.
9. 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.
10. 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.
11. If more than one form is used to document the transportation and disposal of any 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 HRC for revision.
- B. The HRC 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.
- D. The HRC 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 HRC.
- 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

2.01 GENERAL

- A. The HRC 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 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.

2.02 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.

2.03 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. 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. 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.
- F. 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.
- G. 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.

2.04 DANGER SIGNS AND TAPE

- A. Use danger signs and tape which comply with 29 CFR 1926.62(m); 29 CFR 1926.200; 29 CFR 1926.1101(k)(7); and ANSI Z535 series standards.

2.05 DECONTAMINATION AREA

- A. Provide decontamination areas in accordance with 29 CFR 1926.1101(j).

2.06 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.

2.07 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 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.

2.08 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.

2.09 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.

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. Provide labels for each hazardous material waste covered by this section which conform to the requirements of 29 CFR 1926.200; 29 CFR 1926.1101(k)(8); 40 CFR 262.31; 40 CFR 763.95; 49 CFR 172.101; 49 CFR 172 Subpart E, 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.

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.

2.12 MARKINGS

- A. Provide markings for each hazardous material waste covered by this section which conform to the requirements of 40 CFR 262.32 and 49 CFR 172 Subpart D.

2.13 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.

2.14 PACKAGING

- A. Provide packaging for each 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.

2.15 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 hazardous material removal work in accordance with the requirements of 29 CFR 1926.28, 29 CFR 1926.62, 29 CFR 1926.1101, 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 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 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 HRC's choice of means and methods to complete the work, or due to hazards which are incidental to the hazardous material removal work. The HRC 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 82 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) and 1926.1101(h)(3).
- D. Breathing air quality and use must meet the requirements of 29 CFR 1910.134(i).

2.16 PLACARDS

- A. Provide placards for each hazardous material waste covered by this section which conform to the requirements of 40 CFR 262.33 and 49 CFR 172 Subpart F.

2.17 POLYETHYLENE SHEETING

- A. All polyethylene sheeting used for 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.

2.18 PRESSURE DIFFERENTIAL MONITORING DEVICE

- A. Provide a pressure differential monitoring device for 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.

2.19 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, 29 CFR 1926.62. and 29 CFR 1926.1101(j).

2.20 SPILL RESPONSE MATERIALS

- A. Provide spill response materials including, but not limited to, containers, adsorbent, shovels, and personal protective equipment. Spill response materials must be available at

all times when hazardous materials are being handled or transported. Spill response materials must be compatible with the type of material being handled.

2.21 VACUUMS

- A. Use vacuums which have been designed with a HEPA filter as the last filtration stage for general 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.

2.22 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.

PART 3. EXECUTION

3.01 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 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 hazardous materials:
 - 1. All work involving asbestos must be performed in accordance with 29 CFR 1926.1101, 40 CFR 61 Subpart M, 40 CFR 763, 49 CFR 172 Subpart C, and 18 AAC 60.
 - 2. All work involving universal wastes must be performed in accordance with 40 CFR 273, 18 AAC 60, and 18 AAC 62.
 - 3. All work involving PCB-containing light ballasts must be performed in accordance with 40 CFR 761 and 18 AAC 60.
 - 4. 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.
 - 5. All work involving equipment with radioactive components must be performed in accordance with 10 CFR Chapter I, 18 AAC 60 and 18 AAC 85.
 - 6. All work involving ozone depleting substances must be performed in accordance with 40 CFR 82.
 - 7. 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.
 - 8. All work involving lead-containing materials must be performed in accordance with 29 CFR 1926.62 and 18 AAC 60.

- C. All 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 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.

3.02 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 hazardous materials removal work by non-contractor personnel, that may necessitate modification or revision of the Contractor's approved HAP.
 - 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 HAP. 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.
 - 3. If the HAP 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.

3.03 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.

3.04 PRE-CLEANING AND WORK AREA PREPARATION ACTIVITIES

- A. There is no requirement to remove all pre-existing dusts, debris, or components contaminated by the 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 HRC or GC determines it to be a more cost-effective means of completing the work.
- B. Work involving the removal of hazardous materials which are intact and not contaminated by other hazardous materials are not required by this section 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 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 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 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.

3.05 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.
 - 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.

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- F. Work conducted adjacent to occupied areas must be obscured from those occupants to the greatest extent practicable.
- G. The HRC 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.
- K. All hazardous materials covered by this section which are defined as a universal waste by 40 CFR 763.9 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.
- L. Onsite treatment as defined by 40 CFR 260.10 of any wastes covered by this section is prohibited.
- M. All heat transfer fluids which are removed and will not be reused must be sent to an offsite facility for recycling.
- N. 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 HRC must maintain a sign-in sheet to record all persons entering and exiting the NPE.
- O. 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.
- P. 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.

3.06 MATERIALS TESTING REQUIREMENTS

- A. Any asbestos 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.
 - 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.
- B. All lead-containing waste streams must be TCLP tested in accordance with 40 CFR 261 to determine disposal requirements. Other hazardous materials which are managed in accordance with this section do not require additional testing.
- C. Testing of the 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.

- D. 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.

3.07 MONITORING

A. Asbestos

1. General
 - a. For all work covered by this section which requires the establishment of a regulated area, air monitoring must be performed.
 - b. Air monitoring must be performed at all times work covered by this section is being conducted for the duration of the project.
 - c. Air monitoring must be performed by the CPIH.
 - d. The CPIH must submit lab blanks and field blanks in accordance with the requirements of the analytical method being used.
 - e. 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.
 - f. 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.
 - g. The minimum air monitoring requirements of this section apply to each regulated area and each shift separately.
 - h. Air monitoring is not required by this section for intact removal of asbestos-containing materials.
 - i. 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.
2. 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.
3. Monitoring of personnel:
 - a. Monitoring of personnel must be performed in accordance with 29 CFR 1926.1101.
4. For all interior work, and for exterior work which cannot be performed using non-aggressive means, air monitoring during the work must include:
 - a. A minimum of three (3) air samples from within the regulated area boundaries.
 - b. A minimum of three (3) air samples from areas outside of but adjacent to the regulated area boundaries.
 - c. One (1) air sample at the entrance to the regulated area.

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- d. One (1) air sample at the waste loadout area during waste loadout operations.
- e. One (1) air sample at the approximate location of HEPA exhaust discharge.
- 5. For exterior work performed using non-aggressive means, air monitoring during the work must include:
 - a. A minimum of two (2) air samples from within the regulated area boundaries.
 - b. A minimum of two (2) air samples from areas outside of but adjacent to the regulated area boundaries.
- 6. 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:
 - a. A minimum of one (1) air sample taken from each of the employee's breathing zone.
 - b. A minimum of two (2) air samples collected directly adjacent to where the removal work is taking place.

B. Non-Asbestos-Containing Materials

- 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.
- 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 $<10 \mu\text{g}/\text{ft}^2$.
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.

3.08 WORK AREA INSPECTIONS AND CLEARANCES

A. Asbestos

1. General:
 - a. All clearance air monitoring and final visual inspections must be performed by the IIHT.
 - b. 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.
 - c. The final visual inspection must be thorough and performed in accordance with the protocols found in ASTM E1368 and 40 CFR 763.
 - d. All final visual inspections and clearance air monitoring must be documented in writing.
 - e. Clearance air monitoring is required for all work conducted inside of regulated areas unless noted otherwise by this section.
 - f. 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.
 - g. All clearance air monitoring must be performed using aggressive methods as described in Appendix A to 40 CFR 763 Subpart E.
 - h. The IIHT must submit lab blanks and field blanks in accordance with the requirements of the analytical method being used.
 - i. The quantities and types of air monitoring required by this section are the minimum requirements and apply to each regulated area separately.
 - j. Onsite analysis of clearance air samples is prohibited.

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- k. Clearance air monitoring is not required by this section for intact removal of asbestos-containing materials or for exterior asbestos removal activities.
 - l. 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.
 - m. 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.
2. TEM clearance air monitoring:
- a. 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.
 - b. 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.
 - c. 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.
 - d. Is required for all other interior work requiring the removal of greater than 160 linear feet or 260 square feet of asbestos-containing material.
 - e. Must include a minimum of five (5) clearance air samples from within the regulated area boundaries.
 - f. 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.
3. PCM clearance air monitoring:
- a. 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.
 - b. May be performed for all other interior work which is not required to have TEM clearance air monitoring.
 - c. Must include a minimum of five (5) clearance air samples from within the regulated area boundaries.
 - d. 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.

B. Non-Asbestos-Containing Materials

- 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, 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.

C. 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.

D. 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 outside of the area of removal. To achieve satisfactory clearance criteria, each of the samples collected must be <200 µg/ft² 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 $<10 \mu\text{g}/\text{ft}^2$.
- E. Where work is being conducted in a facility that meets the definition of a “child occupied facility” as defined by 40 CFR 745.83 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 procedures described in 40 CFR 745.227(e)(8). To achieve satisfactory clearance criteria, each of the samples collected must be less than the published Lead Dust Hazard Standards criteria current at the time of completion of the work.
- F. Where work is being conducted in a facility that meets the definition of a “child occupied facility” as defined by 40 CFR 745.83 and is subject to regulation by 40 CFR 745 due to the quantities of lead-based paints being removed.
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 procedures described in 40 CFR 745.227(e)(8). To achieve satisfactory clearance criteria, each of the samples collected must be less than the published Lead Dust Hazard Standards criteria current at the time of completion of the work.

3.09 POST-WORK ACTIVITIES

- A. The HRC 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 HRC must promptly clean up the dust or debris and record those actions on their daily report.
- B. The GC, HRC, 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 HRC’s activities at the site.
- C. The HRC must submit all documentation required by this section for Owner review and approval.
- D. After the HRC 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

CONCRETE FORMING AND ACCESSORIES

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 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 the EPA and OSHA requirements.

1.02 RELATED DOCUMENTS

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

1.03 SUMMARY

- A. Section Includes:
 - 1. Form-facing material for cast-in-place concrete.
 - 2. Shoring, bracing, and anchoring.
- B. Related Requirements:
 - 1. Section 03 30 00 "Cast-in-Place Concrete".

1.04 DEFINITIONS

- A. Form-Facing Material: Temporary structure or mold for the support of concrete while the concrete is setting and gaining sufficient strength to be self-supporting.
- B. Formwork: The total system of support of freshly placed concrete, including the mold or sheathing that contacts the concrete, as well as supporting members, hardware, and necessary bracing.

1.05 QUALITY ASSURANCE

- A. Testing and Inspection Agency Qualifications: An independent agency, acceptable to the Municipality of Anchorage Building Safety Division, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

PART 2. PRODUCTS

2.01 RELATED MATERIALS

- A. Reglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- B. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- E. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
 - 2. Form release agent for form liners shall be acceptable to form liner manufacturer.
- F. Form Ties: Factory-fabricated, removable or snap-off, glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.
 - 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

PART 3. EXECUTION

3.01 INSTALLATION OF FORMWORK

- A. Comply with ACI 301.
- B. Construct formwork, so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 and to comply with the Surface Finish designations specified in Section 03 30 00 "Cast-In-Place Concrete" for as-cast finishes.
- C. Limit concrete surface irregularities as follows:
 - 1. Surface Finish-1.0: ACI 117 Class D, 1 inch.
 - 2. Surface Finish-2.0: ACI 117 Class B, 1/4 inch.
 - 3. Surface Finish-3.0: ACI 117 Class A, 1/8 inch.
- D. Construct forms tight enough to prevent loss of concrete mortar.
 - 1. Minimize joints.
 - 2. Exposed Concrete: Symmetrically align joints in forms.

- E. Construct removable forms for easy removal without hammering or prying against concrete surfaces.
 - 1. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.
 - 2. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 3. Install keyways, reglets, recesses, and other accessories, for easy removal.
- F. Do not use rust-stained, steel, form-facing material.
- G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces.
 - 1. Provide and secure units to support screed strips
 - 2. Use strike-off templates or compacting-type screeds.
- H. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible.
 - 1. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar.
 - 2. Locate temporary openings in forms at inconspicuous locations.
- I. Chamfer exterior corners and edges of permanently exposed concrete.
- J. At construction joints, overlap forms onto previously placed concrete not less than 12 inches.
- K. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work.
 - 1. Determine sizes and locations from trades providing such items.
 - 2. Obtain written approval of Architect prior to forming openings not indicated on Drawings.
- L. Construction and Movement Joints:
 - 1. Construct joints true to line with faces perpendicular to surface plane of concrete.
 - 2. Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 3. Place joints perpendicular to main reinforcement.
 - 4. Locate joints for beams, slabs, joists, and girders in the middle third of spans.
 - a. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
- M. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection.
 - 1. Locate ports and openings in bottom of vertical forms, in inconspicuous location, to allow flushing water to drain.
 - 2. Close temporary ports and openings with tight-fitting panels, flush with inside face of form, and neatly fitted, so joints will not be apparent in exposed concrete surfaces.

- N. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- O. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- P. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.02 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete.
 - 1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
 - 3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 - 4. Install dovetail anchor slots in concrete structures, as indicated on Drawings.
 - 5. Clean embedded items immediately prior to concrete placement.

3.03 REMOVING AND REUSING FORMS

- A. Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
 - 1. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work.
 - 1. Split, frayed, delaminated, or otherwise damaged form-facing material are unacceptable for exposed surfaces.
 - 2. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints.
 - 1. Align and secure joints to avoid offsets.
 - 2. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.04 SHORING AND RESHORING INSTALLATION

- A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.
 - 1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

CONCRETE FORMING AND ACCESSORIES

Division 3

Section 03 10 00

- B. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.05 FIELD QUALITY CONTROL

- A. Special Inspections: Special inspection is not required for concrete housekeeping pads.

END OF SECTION

CONCRETE REINFORCING

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 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 the EPA and OSHA requirements.

1.02 RELATED DOCUMENTS

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

1.03 SUMMARY

- A. Section Includes:
 - 1. Steel reinforcement bars.
 - 2. Welded-wire reinforcement.
- B. Related Requirements:
 - 1. Section 03 30 00 "Cast-In-Place Concrete".

1.04 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Each type of steel reinforcement.
 - 2. Bar supports.
 - 3. Mechanical splice couplers.
- B. Shop Drawings: Comply with ACI SP-066:
 - 1. Include placing drawings that detail fabrication, bending, and placement.
 - 2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.
 - 3. For structural thermal break insulated connection system, indicate general configuration, insulation dimensions, tension bars, compression pads, shear bars, and dimensions.
- C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.

1. Location of construction joints is subject to approval of the Architect.

1.05 INFORMATIONAL SUBMITTALS

- A. Qualification Statements: For testing and inspection agency.
- B. Welding certificates.
 1. Reinforcement To Be Welded: Welding procedure specification in accordance with AWS D1.4/D1.4M
- C. Material Test Reports: For the following, from a qualified testing agency:
 1. Steel Reinforcement:
 - a. For reinforcement to be welded, mill test analysis for chemical composition and carbon equivalent of the steel in accordance with ASTM A706/A706M.
 2. Mechanical splice couplers.
- D. Field quality-control reports.

1.06 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, acceptable to the Municipality of Anchorage Building Safety Division, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.
- B. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.4/D 1.4M.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
 1. Store reinforcement to avoid contact with earth.

PART 2. PRODUCTS

2.01 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.
- B. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.
- C. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

2.02 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A615/A615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.
 - 1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - a. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.
 - b. For epoxy-coated reinforcement, use CRSI Class 1A epoxy-coated or other dielectric-polymer-coated wire bar supports.
 - c. For dual-coated reinforcement, use CRSI Class 1A epoxy-coated or other dielectric-polymer-coated wire bar supports.
 - d. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.
 - e. For stainless steel reinforcement, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.
- C. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.
 - 1. Finish: Plain.

2.03 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3. EXECUTION

3.01 PREPARATION

- A. Protection of In-Place Conditions:
 - 1. Do not cut or puncture vapor retarder.
 - 2. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.02 INSTALLATION OF STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.
- B. Accurately position, support, and secure reinforcement against displacement.
 - 1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
 - 2. Do not tack weld crossing reinforcing bars.

- C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.
- D. Provide concrete coverage in accordance with ACI 318.
- E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- F. Splices: Lap splices as indicated on Drawings.
 - 1. Bars indicated to be continuous, and all vertical bars shall be lapped not less than 36 bar diameters at splices, or 24 inches, whichever is greater.
 - 2. Stagger splices in accordance with ACI 318.
 - 3. Mechanical Splice Couplers: Install in accordance with manufacturer's instructions.
 - 4. Weld reinforcing bars in accordance with AWS D1.4/D 1.4M, where indicated on Drawings.
- G. Install welded-wire reinforcement in longest practicable lengths.
 - 1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."
 - a. For reinforcement less than W4.0 or D4.0, continuous support spacing shall not exceed 12 inches.
 - 2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches for plain wire and 8 inches for deformed wire.
 - 3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
 - 4. Lace overlaps with wire.

3.03 JOINTS

- A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Place joints perpendicular to main reinforcement.
 - 2. Continue reinforcement across construction joints unless otherwise indicated.
 - 3. Do not continue reinforcement through sides of strip placements of floors and slabs.
- B. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length, to prevent concrete bonding to one side of joint.

3.04 INSTALLATION TOLERANCES

- A. Comply with ACI 117.

3.05 FIELD QUALITY CONTROL

- A. Special Inspections: Special inspection is not required for concrete housekeeping pads.

END OF SECTION

CAST-IN-PLACE CONCRETE

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 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 the EPA and OSHA requirements.

1.02 RELATED DOCUMENTS

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

1.03 SUMMARY

- A. Section Includes:
 - 1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

1.04 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.05 ACTION SUBMITTALS

- A. Product Data: For each of the following.
 - 1. Portland cement.
 - 2. Slag cement.
 - 3. Aggregates.
 - 4. Admixtures:
 - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.

5. Floor and slab treatments.
6. Curing materials.
 - a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.
7. Joint fillers.
8. Repair materials.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Calculated equilibrium unit weight, for lightweight concrete.
6. Slump limit.
7. Air content.
8. Nominal maximum aggregate size.
9. Steel-fiber reinforcement content.
10. Synthetic micro-fiber content.
11. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
12. Include manufacturer's certification that permeability-reducing admixture is compatible with mix design.
13. Include certification that dosage rate for permeability-reducing admixture matches dosage rate used in performance compliance test.
14. Intended placement method.
15. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

1. Installer: Include copies of applicable ACI certificates.
2. Ready-mixed concrete manufacturer.
3. Testing agency: Include copies of applicable ACI certificates.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.
4. Floor and slab treatments.
5. Bonding agents.
6. Adhesives.
7. Vapor retarders.
8. Semirigid joint filler.
9. Joint-filler strips.
10. Repair materials.

C. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.

2. Aggregates.

D. Floor surface flatness and levelness measurements report, indicating compliance with specified tolerances.

E. Research Reports:

1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
2. For sheet vapor retarder/termite barrier, showing compliance with ICC AC380.

F. Preconstruction Test Reports: For each mix design.

G. Field quality-control reports.

1.07 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs Project personnel qualified as an ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician.

1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated and employing an ACI-certified Concrete Quality Control Technical Manager.

1. Personnel performing laboratory tests shall be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

D. Field Quality Control Testing Agency Qualifications: An independent agency, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests shall be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.

1.08 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.

1. Include the following information in each test report:
 - a. Admixture dosage rates.

- b. Slump.
- c. Air content.
- d. Seven-day compressive strength.
- e. 28-day compressive strength.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ASTM C94/C94M and ACI 301.

1.10 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.

- 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2. PRODUCTS

2.01 CONCRETE, GENERAL

- A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.02 CONCRETE MATERIALS

- A. Source Limitations:

- 1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
- 2. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
- 3. Obtain aggregate from single source.
- 4. Obtain each type of admixture from single source from single manufacturer.

- B. Cementitious Materials:

- 1. Portland Cement: ASTM C150/C150M.

- C. Normal-Weight Aggregates: ASTM C33/C33M, coarse aggregate or better, graded. Provide aggregates from a single source.

- 1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
- 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

- D. Air-Entraining Admixture: ASTM C260/C260M.

- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.

2.03 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.
 1. Color:
 - a. Ambient Temperature Below 50 deg F: Black.
 - b. Ambient Temperature between 50 deg F and 85 deg F: Any color.
 - c. Ambient Temperature Above 85 deg F: White.
- D. Curing Paper: Eight-foot-wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.
- E. Water: Potable or complying with ASTM C1602/C1602M.
- F. Clear, Solvent-Borne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.

2.04 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 in accordance with ASTM D2240.
- C. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade and class to suit requirements, and as follows:
 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- E. Floor Slab Protective Covering: Eight-foot-wide cellulose fabric.

2.05 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand, as recommended by underlayment manufacturer.
 4. Compressive Strength: Not less than 4100 psi at 28 days when tested in accordance with ASTM C109/C109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
 4. Compressive Strength: Not less than 5000 psi Insert strength at 28 days when tested in accordance with ASTM C109/C109M.

2.06 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.
1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Fly Ash or Other Pozzolans: 25 percent by mass.
 2. Slag Cement: 50 percent by mass.
 3. Silica Fume: 10 percent by mass.
 4. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
 5. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
- C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
1. Use water-reducing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in concrete with a w/cm below 0.50.

4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
5. Use permeability-reducing admixture in concrete mixtures where indicated.

D. Color Pigment: Add color pigment to concrete mixture in accordance with manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

2.07 CONCRETE MIXTURES

A. All cast-in-place concrete.

1. Exposure Class: ACI 318 F0 S0 W0 C1.
2. Minimum Compressive Strength: 4500 psi at 28 days.
3. Maximum w/cm: 0.45.
4. Slump Limit: 4 inches, plus or minus 1 inch.
5. Slump Flow Limit: 22 inches, plus or minus 1.5 inches.
6. Air Content:
 - a. Exposure Classes F2 and F3: 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 3/4-inch nominal maximum aggregate size.
7. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.

2.08 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M, and furnish batch ticket information.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.
1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
 2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.
 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3. EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:
 - 1. Daily access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
 - 4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.03 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.
 - 1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
 - 3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.04 INSTALLATION OF VAPOR RETARDER

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.
 - 1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
 - 2. Face laps away from exposed direction of concrete pour.
 - 3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
 - 4. Lap joints 6 inches and seal with manufacturer's recommended tape.
 - 5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
 - 6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
 - 7. Protect vapor retarder during placement of reinforcement and concrete.
 - a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.
- B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder in accordance with manufacturer's written instructions.

3.05 JOINTS

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
 2. Place joints perpendicular to main reinforcement.
 - a. Continue reinforcement across construction joints unless otherwise indicated.
 - b. Do not continue reinforcement through sides of strip placements of floors and slabs.
 3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 6. Space vertical joints in walls as indicated on Drawings. Unless otherwise indicated on Drawings, locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.
 7. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 8. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.
- D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
 2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Section 07 92 00 "Joint Sealants," are indicated.
 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints:
1. Install dowel bars and support assemblies at joints where indicated on Drawings.
 2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.
- F. Dowel Plates: Install dowel plates at joints where indicated on Drawings.

3.06 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
 - 1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
 - 2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.
 - 1. If a section cannot be placed continuously, provide construction joints as indicated.
 - 2. Deposit concrete to avoid segregation.
 - 3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.
 - a. Do not use vibrators to transport concrete inside forms.
 - b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
 - c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
 - d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Do not place concrete floors and slabs in a checkerboard sequence.
 - 2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 3. Maintain reinforcement in position on chairs during concrete placement.
 - 4. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 5. Level concrete, cut high areas, and fill low areas.
 - 6. Slope surfaces uniformly to drains where required.

7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

3.07 FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:

1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.
 - a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
 - b. Remove projections larger than 1 inch.
 - c. Tie holes do not require patching.
 - d. Surface Tolerance: ACI 117 Class D.

B. Related Unformed Surfaces:

1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.08 FINISHING FLOORS AND SLABS

A. Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish:

1. While still plastic, texture concrete surface that has been screeded and bull-floated or darbied.
2. Use stiff brushes, brooms, or rakes to produce a profile depth of 1/4 inch in one direction.
3. Apply scratch finish to surfaces to receive concrete floor toppings.

C. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
3. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

D. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighen until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

4. Do not add water to concrete surface.
 5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
 6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 7. Finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface:
 - a. Slabs on Ground:
 - 1) Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4 inch.
 - 2) Specified overall values of flatness, F_F 25; and of levelness, F_L 20; with minimum local values of flatness, F_F 17; and of levelness, F_L 15.
 - 3) Specified overall values of flatness, F_F 35; and of levelness, F_L 25; with minimum local values of flatness, F_F 24; and of levelness, F_L 17.
 - 4) Specified overall values of flatness, F_F 45; and of levelness, F_L 35; with minimum local values of flatness, F_F 30; and of levelness, F_L 24.
 - 5) Specified Overall Value (SOV): F_F 50 and F_L 25 with minimum local value (MLV): F_F 40 and F_L 17.
 - 6) Specified Overall Value (SOV): F_F 25 and F_L 20 with minimum local value (MLV): F_F 17 and F_L 15.
 - b. Suspended Slabs:
 - 1) Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4 inch.
 - 2) Specified overall values of flatness, F_F 25; and of levelness, F_L 20; with minimum local values of flatness, F_F 17; and of levelness, F_L 15.
 - 3) Specified overall values of flatness, F_F 35; and of levelness, F_L 20; with minimum local values of flatness, F_F 24; and of levelness, F_L 15.
 - 4) Specified overall values of flatness, F_F 45; and of levelness, F_L 35; with minimum local values of flatness, F_F 30; and of levelness, F_L 24.
- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.
1. Coordinate required final finish with Architect before application.
 2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
 2. Coordinate required final finish with Architect before application.
- G. Slip-Resistive Finish: Before final floating, apply slip-resistive aggregate finish to concrete stair treads, platforms, ramps as indicated on Drawings

1. Apply in accordance with manufacturer's written instructions and as follows:
 - a. Uniformly spread 25 lb/100 sq. ft. of dampened slip-resistive aggregate over surface in one or two applications.
 - b. Tamp aggregate flush with surface, but do not force below surface.
 - c. After broadcasting and tamping, apply float finish.
 - d. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aggregate.

3.09 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling In:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 4 inches high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
3. Minimum Compressive Strength: 4500 psi at 28 days.
4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
6. Prior to pouring concrete, place and secure anchorage devices.
 - a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - b. Cast anchor-bolt insert into bases.
 - c. Install anchor bolts to elevations required for proper attachment to supported equipment.

3.10 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h before and during finishing operations.

B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
3. If forms remain during curing period, moist cure after loosening forms.
4. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:
 - a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
 - b. Continuous Sprinkling: Maintain concrete surface continuously wet.
 - c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
 - d. Water-Retention Sheetting Materials: Cover exposed concrete surfaces with sheetting material, taping, or lapping seams.
 - e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 1) Recoat areas subject to heavy rainfall within three hours after initial application.
 - 2) Maintain continuity of coating and repair damage during curing period.

C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:

1. Begin curing immediately after finishing concrete.
2. Interior Concrete Floors:
 - a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:
 - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - a) Lap edges and ends of absorptive cover not less than 12-inches.
 - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
 - a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - b) Cure for not less than seven days.
 - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
 - a) Water.
 - b) Continuous water-fog spray.

- b. Floors to Receive Penetrating Liquid Floor Treatments: Contractor has option of the following:
- 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - a) Lap edges and ends of absorptive cover not less than 12 inches.
 - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
 - a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - b) Cure for not less than seven days.
 - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
 - a) Water.
 - b) Continuous water-fog spray.
- c. Floors to Receive Polished Finish: Contractor has option of the following:
- 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - a) Lap edges and ends of absorptive cover not less than 12 inches.
 - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 2) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
 - a) Water.
 - b) Continuous water-fog spray.
- d. Floors to Receive Chemical Stain:
- 1) As soon as concrete has sufficient set to permit application without marring concrete surface, install curing paper over entire area of floor.
 - 2) Install curing paper square to building lines, without wrinkles, and in a single length without end joints.
 - 3) Butt sides of curing paper tight; do not overlap sides of curing paper.
 - 4) Leave curing paper in place for duration of curing period, but not less than 28 days.

e. Floors to Receive Urethane Flooring:

- 1) As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
- 2) Rewet absorptive cover, and cover immediately with polyethylene moisture-retaining cover with edges lapped 6 inches and sealed in place.
- 3) Secure polyethylene moisture-retaining cover in place to prohibit air from circulating under polyethylene moisture-retaining cover.
- 4) Leave absorptive cover and polyethylene moisture-retaining cover in place for duration of curing period, but not less than 28 days.

f. Floors to Receive Curing Compound:

- 1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
- 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
- 3) Maintain continuity of coating, and repair damage during curing period.
- 4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.

g. Floors to Receive Curing and Sealing Compound:

- 1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
- 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
- 3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

3.11 TOLERANCES

- A. Conform to ACI 117.

3.12 APPLICATION OF LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment in accordance with manufacturer's written instructions.

1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
2. Do not apply to concrete that is less than three days' old.
3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing.
4. Rinse with water; remove excess material until surface is dry.
5. Apply a second coat in a similar manner if surface is rough or porous.

- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

3.13 JOINT FILLING

- A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least [one] [six] month(s).
 - 2. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints.
- D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.14 CONCRETE SURFACE REPAIRS

- A. Defective Concrete:
 - 1. Repair and patch defective areas when approved by Architect.
 - 2. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.
 - a. Limit cut depth to 3/4 inch.
 - b. Make edges of cuts perpendicular to concrete surface.
 - c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
 - d. Fill and compact with patching mortar before bonding agent has dried.
 - e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 - 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.
 - a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
 - b. Compact mortar in place and strike off slightly higher than surrounding surface.
 - 3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces:
 - 1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.

- a. Correct low and high areas.
 - b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
3. After concrete has cured at least 14 days, correct high areas by grinding.
4. Correct localized low areas during, or immediately after, completing surface-finishing operations by cutting out low areas and replacing with patching mortar.
 - a. Finish repaired areas to blend into adjacent concrete.
5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
 - a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 - b. Feather edges to match adjacent floor elevations.
6. Correct other low areas scheduled to remain exposed with repair topping.
 - a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
 - b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.
 - a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
 - b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
 - c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
 - d. Place, compact, and finish to blend with adjacent finished concrete.
 - e. Cure in same manner as adjacent concrete.
8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.
 - a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
 - b. Dampen cleaned concrete surfaces and apply bonding agent.
 - c. Place patching mortar before bonding agent has dried.
 - d. Compact patching mortar and finish to match adjacent concrete.
 - e. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.15 FIELD QUALITY CONTROL

- A. Special Inspections: Special inspection is not required for concrete housekeeping pads.

3.16 PROTECTION

- A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using Floor Slab Protective Covering.

END OF SECTION

STRUCTURAL STEEL FRAMING

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 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 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 the EPA and OSHA requirements.

1.2 RELATED DOCUMENTS

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

1.3 SUMMARY

- A. Section Includes:

- 1. Structural steel.

1.4 DEFINITIONS

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

1.5 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.6 ACTION SUBMITTALS

- A. Product Data:

- 1. Structural-steel materials.
 - 2. High-strength, bolt-nut-washer assemblies.
 - 3. Shear stud connectors.
 - 4. Anchor rods.

5. Threaded rods.
6. Shop primer.
7. Etching cleaner.
8. Shrinkage-resistant grout.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment Drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
5. Identify members and connections of the seismic-load-resisting system.
6. Indicate locations and dimensions of protected zones.
7. Identify demand-critical welds.
8. Identify members not to be shop primed.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide in accordance with AWS D1.1/D1.1M for each welded joint qualified by testing, including the following:

1. Power source (constant current or constant voltage).
2. Electrode manufacturer and trade name, for demand-critical welds.

1.7 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- C. Mill test reports for structural-steel materials, including chemical and physical properties.
- D. Product Test Reports: For the following:
1. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
 2. Direct-tension indicators.
 3. Tension-control, high-strength, bolt-nut-washer assemblies.
 4. Shear stud connectors.

- E. Survey of existing conditions.
- F. Source quality-control reports.
- G. Field quality-control reports.

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU or is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172).

- B. Installer Qualifications: A qualified Installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.
- C. Shop-Painting Applicators: Qualified in accordance with SSPC-QP 3.
- D. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.
 - 1. Welders and welding operators performing work on bottom-flange, demand-critical welds must pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G must be considered separate processes for welding personnel qualification.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
 - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 - 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 - 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

PART 2. PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with applicable provisions of the following specifications and documents:
 - 1. ANSI/AISC 303.
 - 2. ANSI/AISC 341.
 - 3. ANSI/AISC 360.
 - 4. RCSC's "Specification for Structural Joints Using High-Strength Bolts."
- B. Connection Design Information:
 - 1. Option 1: Connection designs have been completed and connections indicated on the Drawings.

2.2 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A992/A992M.
- B. Channels, Angles-Shapes: ASTM A36/A36M.

- C. Plate and Bar: ASTM A36/A36M.
- D. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade C structural tubing.
- E. Steel Pipe: ASTM A53/A53M, Type E or Type S, Grade B.
- F. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS AND CONNECTORS

- A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
 - 1. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with plain finish.
- B. Shear Stud Connectors: ASTM A108, AISI C-1015 through C-1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

2.4 RODS

- A. Unheaded Anchor Rods: ASTM F1554, Grade 36.
 - 1. Configuration: Straight.
 - 2. Nuts: ASTM A563 heavy-hex carbon steel.
 - 3. Plate Washers: ASTM A36/A36M carbon steel.
 - 4. Washers: ASTM F436, Type 1, hardened carbon steel.
 - 5. Finish: Plain.
- B. Headed Anchor Rods: ASTM F1554, Grade 36, straight.
 - 1. Nuts: ASTM A563 heavy-hex carbon steel.
 - 2. Plate Washers: ASTM A36/A36M carbon steel.
 - 3. Washers: ASTM F436, Type 1, hardened carbon steel.
 - 4. Finish: Plain.

2.5 PRIMER

- A. Steel Primer:
 - 1. SSPC-Paint 23, latex primer.
 - 2. Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

2.6 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.
 - 1. Camber structural-steel members where indicated.
 - 2. Fabricate beams with rolling camber up.

3. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing has been erected.
 4. Mark and match-mark materials for field assembly.
 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted in accordance with SSPC-SP 1.
- F. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using automatic end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.
- G. Steel Wall-Opening Framing: Select true and straight members for fabricating steel wall-opening framing to be attached to structural-steel frame. Straighten as required to provide uniform, square, and true members in completed wall framing. Build up welded framing, weld exposed joints continuously, and grind smooth.
- H. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
1. Cut, drill, or punch holes perpendicular to steel surfaces.
 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.7 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.
1. Joint Type: As indicated.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

2.8 SHOP PRIMING

- A. Shop prime steel surfaces, except the following:
1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.

2. Surfaces to be field welded.
3. Surfaces of high-strength bolted, slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
5. Corrosion-resisting (weathering) steel surfaces.
6. Surfaces enclosed in interior construction.

- B. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with the following specifications and standards:

1. SSPC-SP 2.
2. SSPC-SP 3.
3. SSPC-SP 7 (WAB)/NACE WAB-4.
4. SSPC-SP 14 (WAB)/NACE WAB-8.
5. SSPC-SP 11.
6. SSPC-SP 6 (WAB)/NACE WAB-3.
7. SSPC-SP 10 (WAB)/NACE WAB-2.
8. SSPC-SP 5 (WAB)/NACE WAB-1.
9. SSPC-SP 8.

- C. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.9 SOURCE QUALITY CONTROL

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

1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
2. Bolted Connections: Inspect and test shop-bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
3. Welded Connections: Visually inspect shop-welded connections in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E165/E165M.
 - b. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - c. Ultrasonic Inspection: ASTM E164.
 - d. Radiographic Inspection: ASTM E94/E94M.
4. In addition to visual inspection, test and inspect shop-welded shear stud connectors in accordance with requirements in AWS D1.1/D1.1M for stud welding and as follows:
 - a. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear stud connector.
 - b. Conduct tests in accordance with requirements in AWS D1.1/D1.1M on additional shear stud connectors if weld fracture occurs on shear stud connectors already tested.

5. Prepare test and inspection reports.

PART 3. EXECUTION

3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
 1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated on Drawings.
 1. Do not remove temporary shoring supporting composite deck construction and structural-steel framing until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.
- B. Maintain erection tolerances of structural steel within ANSI/AISC 303.
- C. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 1. Level and plumb individual members of structure. Slope roof framing members to slopes indicated on Drawings.
 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- D. Splice members only where indicated.
- E. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.
- F. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.
 - 1. Joint Type: As indicated.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - 2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
 - 3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

3.5 PROTECTION

- A. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing, and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

END OF SECTION

JOINT SEALANTS

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 RELATED SECTIONS

- A. Section 03 30 00 – Cast-in-Place Concrete
- B. Section 09 21 16 – Gypsum Board Assemblies
- C. Section 09 90 00 – Painting and Coating
- D. Division 21, 22, 23 – Plumbing
- E. Division 23 – Heating
- F. Division 26, 27, 28 – Electrical

1.3 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 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 C834 - Specifications for Latex Sealants.
 - 5. ASTM C919 - Practice for Use of Sealants in Acoustical Applications.
 - 6. ASTM C920 - Specification for Elastomeric Joint Sealants.
 - 7. ASTM C1193 - Guide for Use of Joint Sealants.
 - 8. ASTM C1330 – Specification for Cylindrical Sealant Backing for use with Cold Liquid Applied Sealants
 - 9. ASTM D1667 - Specification for Flexible Cellular Materials Poly Vinyl Chloride Polymers and Copolymers Foam (Closed-Cell).
 - 10. Federal Specification (FS): Specific References as noted.

1.4 SUBMITTALS

- A. Sealants including colors, backing, 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 manufacturer's label and name, type, color, and applicable standards.
- C. Installer qualifications.

1.5 QUALITY ASSURANCE

- A. Manufacturer of sealant shall have been in 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.

1.6 DELIVERY AND STORAGE

- A. Deliver in manufacturer's original unopened container, clearly indentifying each product.
- B. Store in accord with manufacturer's recommendations.

1.7 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 in metal flashing and glazing with temperature 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 manufacturer for substrates and for conditions of service.
- B. Acceptable Sealant Manufacturers: Subject to compliance with specified criteria:
 1. Dow Corning <http://www.dowcorning.com>
 2. General Electric <http://www.ge sealants.com>
 3. Tremco <http://www.tremco.com>
 4. Sika Corporation <http://www.sikaindustry.com>
 5. Sonneborn Chemrex Inc <http://www.chemrex.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 manufacturer for condition of use.
 5. Federal Specification (FS) TT-S-00230C or 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 of including black, white, brown, grey and translucent.
- B. For metal flashing, tile and vapor retarder 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. FS TT-S-00230C or 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 one side.
 2. 3/16 inch minimum thickness or as necessary for 30 percent compression in 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. <http://www.chemrex.com>
 2. Gaska-Tape Inc. <http://www.gaska-tape.com>
 3. Norton Performance Plastics <http://www.nortonadhesives.com>.

2.4 FLOOR AND PAVING SEALANT

- A. Self-leveling, non-staining polyurethane type recommended in writing by manufacturer for horizontal traffic floor joints:
1. Single or multi field component.
 2. Movement range plus or minus 25 percent.
 3. Shore A hardness 25-40, non-staining polyurethane type.
 4. Federal Specification: FS TT-S-00230C or ASTM C920.
 5. Color: gray for concrete surfaces. For other than concrete floors match adjacent surfaces as closely as possible with manufacturer's standard black, gray or brown.

2.5 ACOUSTICAL (SOUND) SEALANT

- A. Single component non-sag FS TT-S-00230, and ASTM C834 non hardening acrylic latex, or synthetic rubber recommended in writing for condition of use.
- B. Surface fire characteristics: flame spread 5, smoke developed 0.

2.6 BACKING MATERIALS AND BOND BREAKERS

- A. Flexible non-gassing polyethylene or polyurethane foam backing filler rod and bond break tips in accord with 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 application to prevent 3-sided adhesion where backer rod cannot be used.

2.7 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 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 sealant manufacturer.
- B. Paint: Where scheduled shall be applied after sealant application.
- C. Primer: Where recommended by sealant manufacturer shall be neatly applied before back-up materials and sealant application. Mask or otherwise protect adjacent surfaces from excess primer.

3.3 BACKING MATERIALS AND BOND BREAKERS INSTALLATION

- A. Install in accordance with ASTM C1193, approved sealant manufacturer's written recommendations and the following. Apply acoustical sealants in accord with 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 manufacturer's recommended width to depth ratio. Do not set deeper than width of joint.
- D. Do not stretch lengthwise to joint.

3.4 SEALANT INSTALLATION

- A. Apply in accordance with manufacturers written recommendations for conditions of use.
- B. Mask as necessary to provide straight neat edges.
- C. Size sealant materials to achieve sealant manufacturer's recommended width to depth ratio: typical depth in joint shall be 1/2 width of joint. Sealant depth shall be 1/4 to 3/8 inch and joint width at least 2 times expected movement.

- D. Install weep tubes to drain exterior cavities to outside at 16 inch maximum spacing.
- E. 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.
- F. Apply under continuous pressure ahead of sealant gun.
- G. Tool joints as soon as possible to produce a consistent smooth joint without voids and foreign matter shape sealant to shed water.
- H. Completed sealed joints shall have uniform, straight sealant bead free of voids, sags, and foreign material.

3.5 JOINTS TO RECEIVE SEALANT

- A. Interior as specifically indicated on DRAWINGS and including:
 - 1. Concrete floor joints.
 - 2. Around edges of electrical and telephone outlet boxes in gypsum board walls and cover entire back of box in offices, conference room and toilet room walls (acoustical Sealant).
 - 3. Around pipe and duct penetrations in walls, floors, and roof.
- B. 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

GYPSUM BOARD ASSEMBLIES

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 RELATED SECTIONS

- A. Section 07 92 00 – Joint Sealants
- B. Section 09 90 00 – Painting and Coating
- C. Division 22 – Access Doors

1.3 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 C1629 – Classification for Abuse Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.
20. ASTM C1658 – Specifications for Glass Mat Gypsum Panels
21. ASTM D3273 – Test Method for Resistance to Growth of Mold 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.

1.4 SUBMITTALS

- A. Special details associated with fire rated assemblies, acoustic seal, control joints, deflection heads and trim.
- B. Provide product data and installation instructions for gypsum board, metal framing, top track deflection framing, edge trim, and expansion and control joints.
- C. Applicator experience: job descriptions, telephone number of owner or architect.

1.5 QUALITY ASSURANCE

- A. Applicator: Company specializing in gypsum board systems with at least 25 jobs similar to this within the last 5 years.

1.6 REGULATORY REQUIREMENTS

- A. Conform to IBC for fire rated assemblies: UL, Gypsum Association or ICC listed assemblies.
- B. Conform to IBC for Steel Studs.

1.7 STORAGE AND HANDLING

- A. Maintain gypsum wallboard above ground protected from weather and moisture.

- B. Do not overload structure by storing concentrated stacks of gypsum wallboard.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Maintain work area, substrate and materials 55 to 85 degrees F, 70 percent maximum relative humidity for 48 hours prior to, 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.
- B. Deflection Heads:
 - 1. Provide U.L. or W.H. fire rate listed 2-piece or slotted screw top track "head of wall" assemblies with any necessary bridging, for 1 inch minimum deflection relief at top of walls:
 - a. Metal-Lite: <http://www.metal-lite.net>
 - b. Fire Trak: <http://www.fire-track.com>,
 - c. Steel Network Inc.: <http://www.steelwork.com>,
 - d. Total Steel RediKlip: http://www.totalsteel.biz/redi_klip.html
 - e. CEMCO FireStik "Fastrack": <http://www.cemcosteel.com>
 - f. BlazeFrame: <http://www.blazeframe.com>
- C. 3 1/2 inches minimum through the wall dimension up to 14 feet maximum length typical unless noted otherwise in the DRAWINGS.
- D. Metal thickness: metal before galvanizing:
 - 1. 20 gage/30 mils (0.0296 inch) typical studs.
- E. Provide punched openings at 1-1/2 inches diameter, not more than 24-inches on center. Studs full single piece for height required.
- F. Finish: Hot dip galvanized G40 per ASTM A654 and ASTM A1003.

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 gage galvanized sheet steel, matching studs and as recommended by the stud manufacturer.
- B. Furring: ASTM C645, 20 gage 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. Resilient Sound Isolation 7/8-inch Furring Channels: 20 gage rolled, knurled face galvanized sheet steel designed for resilient acoustic attachment to GWB; U.S.G. RC-1 or approved

substitutions.

- D. Carrying Channels: ASTM C645, 1-1/2 inch cold rolled steel, 16 gage (0.05 inch) thick minimum. Galvanized in accordance with ASTM A653.
- E. Hanger Wire: Minimum 12 gage galvanized soft annealed steel.
- F. Tie Wire: Minimum 16 gage galvanized soft annealed steel.

2.3 FASTENERS

- A. Self-drilling, self tapping drywall and metal screws to penetrate framing and in accordance with 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 manufacturer may be used if approved by the OWNER'S REPRESENTATIVE. Submit 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 design load in lateral (shear) and pullout (tension) loads into substrate, for condition of use.
- D. Explosive driven anchors not permitted into masonry.
- E. Powder driven anchors not permitted for tension without IBC approval for 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.
- B. Water Resistant Gypsum Board: ASTM C1178; for use as backer under FRP in toilet and bath areas, fire resistive type X 5/8 inch thick, edge square paper free glass mat faced and moisture resistant core. Mold resistant 10 per ASTM D3273. Georgia-Pacific Corp "Dens-Shield", "Tile Backer" or approved.

2.6 ACOUSTICAL AND THERMAL INSULATION

- A. 4" unfaced sound batts.

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.
- B. Extruded mat finish aluminum or stainless steel, square edge shaped matt finish concealed screw attach equal to Fry Reglet "DRMC" – in public areas as indicated and at exposed cement board.
- C. Square edge 3/4 inch paper faced galvanized steel or zinc tape-on-type.

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. Joint compound recommended in writing for additional mold resistance by manufacturer.
 - 1. Use glass fiber tape with setting type compound in high moisture areas and with any glass fiber surfaced gypsum board.
 - 2. Glass Fiber Tape: Alkali resistant open weave glass-mesh fabric: 4 ounce per square yard minimum weight.
- B. Use latex thin-set adhesive and fiberglass tape for cement board joints. Seal cement board exposed surfaces and finish as recommended by board manufacturer.

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 substantially complete behind wall studs and above furred ceilings prior to 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 installation area is enclosed and heated.

3.3 METAL STUD INSTALLATION

- A. Install studding in accordance with ANSI/ASTM C754, ASTM C645, and GA 201, manufacturer's instructions and the DRAWINGS.
 - 1. Set floor tracks in sill sealer insulation specified in Section 07 21 00 - Building Insulation. Trim excess and fire seal in type I and II buildings.
 - 2. Anchor tracks to structure at 18 inches maximum and 2 inches from each track end.
 - 3. Install deflection top track assembly at full height partitions in accord with deflection head manufacturer.
 - 4. Splice tracks with 16-inch piece at stud with two screws per flange to each piece of track.
 - 5. Install studs so open sides face 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. 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.
- E. 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 stud track-runner screw attached to each stud or continuous flat sheet metal strap across faces at studs.
- F. Coordinate installation of backing, anchors, blocking, electrical and mechanical work placed in or behind partition framing.

3.4 SEALANT INSTALLATION

- A. Apply sealants in accord with Section 07 92 00 - Joint Sealants.
- B. Install acoustical sealant continuously at gypsum board perimeter in accord with ASTM C919 at:
 - 1. Metal Framing: track, header, and jamb intersect.
 - 2. Base Layer of double layer systems.

3.5 GYPSUM BOARD INSTALLATION

- A. Install GWB in accordance with 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 degrees angle using a sharp utility knife. Peel back and remove any loose facing from the edges.
- C. Install lead edge of GWB to open end of stud flanges first. Stagger joints on opposite side 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.
- E. Use corrosion resistant screws in showers, exterior entries and any similar wet use areas.
- F. Install exterior gypsum sheathing horizontally, with edges separated slightly and ends occurring over framing or furring.
- G. Use the longest practical GWB panel lengths. Keep butt end joints to a minimum.

3.6 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 jamb edge of door openings over 10 feet wide.

3.7 GYPSUM EDGE TREATMENT

- A. Treat cut edges and holes in water resistant gypsum board with manufacturer recommended sealer.
- B. Place corner beads at external corners. Use longest practical length.
- C. Place edge trim where gypsum board abuts dissimilar materials and where gypsum ends are exposed to view.

3.8 JOINT AND SURFACE TREATMENT

- A. Embed tape at GWB joints and interior angles with joint finishing compound in accord 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 in accordance with manufacturer's instructions.
 - 1. Use setting type joint compound with fiberglass tape for fiberglass faced gypsum board.
 - 2. Allow sufficient drying time between coats to obtain a moisture content of 12 percent or less on GWB and joints.
 - 3. No heavy texture permitted.
- B. Smoothly feather joint compound coats onto adjoining surfaces.
- C. Finish joints to a width at least 6 inches 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, fasteners. Joint compound shall be smooth and free of tool marks and ridges.
3. Walls and Ceilings with Flat Gloss Paint Finish: Level 4: Apply two separate coats of joint compound over the taped joints. Cover fasteners, metal corner bead and trim with three separate coats and as smooth as possible to minimize sanding. Sand any excess joint compound free from lap marks, tool marks, crowned joints, and ridges. Fill scratches, craters and nicks with joint compound.
4. Walls and Ceilings with semi-gloss Paint Finish: Level 5: All joints and interior angles shall have tape embedded in joint compound. Two separate coats of joint compound applied over all flat joints and one separate coat of joint compound 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 in accordance with manufacturer's recommendations, shall be applied to the entire surface. The surface shall be smooth and free of tool marks and ridges.
5. 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.

3.9 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.

3.10 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

ACOUSTICAL CEILING SYSTEMS

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. Suspended metal grid ceiling system.
- B. Acoustical units.

1.3 REFERENCE STANDARDS

- A. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2017.
- B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018b.
- D. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2017.
- E. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.
- F. UL (FRD) - Fire Resistance Directory; Current Edition.
- G. UL (GGG) - GREENGUARD Gold Certified Products; Current Edition.
- H. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Do not install acoustical units until after interior wet work is dry.

1.5 SUBMITTALS

- A. See Division 1 for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.
- C. Product Data: Provide data on suspension system components and acoustical units.
- D. Samples: Submit two full size samples illustrating material and finish of acoustical units.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Division 1 for additional provisions.

1.6 QUALITY ASSURANCE

- A. Fire-Resistive Assemblies: Complete assembly listed and classified by 1 for the fire resistance indicated.
- B. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.
- C. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.

1.7 FIELD CONDITIONS

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2. PRODUCTS

2.1 MANUFACTURERS

- A. Acoustic Tiles/Panels:
 - 1. Armstrong World Industries, Inc: www.armstrong.com/#sle.
 - 2. Substitutions: See Division 1.
- B. Suspension Systems:
 - 1. Armstrong World Industries, Inc: www.armstrong.com/#sle.
 - 2. Substitutions: See Division 1.

2.2 ACOUSTICAL UNITS

- A. To match existing types.

2.3 SUSPENSION SYSTEM(S)

- A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.
- B. Exposed Steel Suspension System Type 15/16" Prelude: Formed steel, commercial quality cold rolled; heavy-duty.

1. Profile: Tee; 15/16 inch wide face.
2. Construction: Double web.
3. Finish: White painted.

2.4 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- B. Hanger Wire: 12-gage 0.08 inch galvanized steel wire.
- C. Gypsum Board: Fire rated type; 5/8 inch thick, ends and edges square, paper faced.
- D. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3. EXECUTION

3.1 INSTALLATION – SUSPENSION SYSTEM

- A. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- B. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 1. Use longest practical lengths.
- C. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- D. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- E. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- F. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- G. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- H. Do not eccentrically load system or induce rotation of runners.
- I. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 1. Use longest practical lengths.
 2. Overlap and rivet corners.

3.2 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to

appearance and function.

- C. Fit border trim neatly against abutting surfaces.
- D. Install units after above-ceiling work is complete.
- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
 - 1. Make field cut edges of same profile as factory edges.
- G. Where round obstructions occur, provide preformed closures to match perimeter molding.
- H. Install hold-down clips on each panel to retain panels tight to grid system; comply with fire rating requirements.

3.3 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

FLUID APPLIED FLOOR COATING

PART 1. GENERAL

1.1 NOTIFICATION

- 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 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. No Asbestos Based Products allowed.
1. International Building Code (IBC) 804.
 2. ASTM D412 – Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
 3. ASTM D522 – Test Methods for Mandrel Bend Test of Attached Organic Coatings.
 4. ASTM D523 – Test Method for Specular Gloss.
 5. ASTM D543 – Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents.
 6. ASTM D2047 – Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces.
 7. ASTM D2794 – Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
 8. ASTM D3363 Test Method for film Hardness by Pencil Test.
 9. ASTM D4060 – Test Method for Abrasion Resistance of Organic-Coatings by the Tabor Abraser.
 10. ASTM D4258 – Practice for Surface Cleaning Concrete for Coating.
 11. ASTM D4259 – Practice for Abrading Concrete.
 12. ASTM D4541 – Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
 13. ASTM F1869 – Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
 14. ASTM F2170 – Test Method for Determining Relative Humidity in Concrete Floors Using insitu Probes.
 15. ASTM F3010 – Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation for Use Under Resilient Floor Coverings.
 16. ASTM G21 – Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

1.3 QUALIFICATIONS

- A. Manufacturer shall have been making liquid applied floor coating with 10 years documented successful experience.
- B. Installer shall have successfully completed at least 5 projects with similar materials within the past 5 years.

1.4 REGULATORY REQUIREMENTS

- A. Conform to IBC 804 Class I interior floor finish: minimum 0.45 watts per square centimeter per NFPA Test Method 253.

1.5 REMOVAL AND REPLACEMENT OF LOOSE EQUIPMENT AND FURNITURE

- A. CONTRACTOR will remove, relocate and replace, or detail around existing floor-mounted equipment to allow a continuous flooring installation.

1.6 MOCKUP

- A. Provide mockup of 10 square feet of flooring with integral wall base.
- B. If accepted, mockup will demonstrate minimum standard for the Work. Mockup may remain as part of the Work.

1.7 SUBMITTALS

- A. Product data for floor coating including substrate preparation, installation and temperature requirements.
- B. Provide analysis and testing certification specified for the work in this Section.
- C. Submit two 6 by 6 inch samples illustrating color and variation.
- D. Submit full line of floor system and aggregate colors for selection.
- E. Submit cleaning and maintenance data. Include procedures for stain removal, and repairing surface.
- F. Manufacturer and Installer submit lists of recent installations utilizing the same or similar flooring and base systems.

1.8 INDOOR AIR QUALITY

- A. The OWNER is concerned about indoor air quality, dust and chemical emissions.
- B. Operate building permanent ventilation system at maximum outdoor airflow before mixing and applying flooring, and for minimum 72 hours after installation.
- C. Enclose and collect floor prep scraping and grinding debris to prevent dust spreading into surrounding building.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Bring only enough products for each days work into building. Remove excess product from building at end of active work period.
- B. Maintain minimum air temperature of 60 degrees F.
- C. Keep products away from fire or open flame.

1.10 TEMPERATURE AND HUMIDITY REQUIREMENTS

- A. Do not install flooring when floor temperature is below 55 degrees F or above 90 degrees F.
- B. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of flooring.
- C. Maintain relative humidity at a minimum of 25 percent and a maximum of 50 percent along with adequate ventilation.
- D. Provide uniform lighting of 50 foot candles in area of installation.
- E. Restrict traffic from area where flooring is being installed or is curing.

1.11 WARRANTY

- A. Provide 2-year warranty from Substantial Completion.
- B. Warrant: floor coating remains smoothly attached to substrate continued resiliency, and freedom from cracks not caused by substrate movement.
- C. Repair or replacement shall be at no cost to Owner.

PART 2. PRODUCTS

2.1 LIQUID APPLIED SEAMLESS FLOOR COATING

- A. High Solids, heavy duty two component catalyzed epoxy coating recommended by its manufacturer for use on concrete commercial floors and with 6 inch integral wall cove base.
 - 1. Fillers, primers, moisture suppressants, sealers: as recommended by topcoat manufacturer for conditions of use.
 - a. Single source responsibility: obtain all floor coating products from single manufacturer or recommended topcoat manufacturer.
- B. Water-phase resin applied in a series of coats providing a slip-resistant floor coating.
 - 1. Basecoat membrane (20 mils)
 - 2. Wearcoarse (12 mils)
 - 3. Broadcast aggregate for slip-resistance
 - 4. Chemically-resistant topcoat
- C. Acceptable manufactures subject to specified criteria:
 - 1. Sherwin-Williams Resufloor Topfloor MER 1 (Mechanical Equipment Room) base coat, wearcoarse, aggregate and top coat: www.sherwin-williams.com/resin-flooring
 - 2. Equivalent systems by Dex-o-Tex: www.dexotex.com; PPG Protective Coatings: www.ppgpmc.com ; or Tennant Coatings Co: www.tennantco.com
- D. Minimum System Thickness: 30 mils dry.
- E. Top Coat Properties:
 - 1. Tensile Strength: ASTM D412: 1,700psi
 - 2. Tensile Elongation ASTM D412: 80%
 - 3. Taber Abrasion: ASTM D4060: 100mgs loss (CS17 Wheel, 1000g Load, 1000 Cycles)
 - 4. Hardness ASTM D2240 Shore D: 50/40

5. Flammability: Self-extinguishing over concrete
 6. Adhesion: ACI 503R: 300 psi concrete failure
 7. Thermal Cycling: ASTM C884: No cracking
- F. Chemical Resistance ASTM D543, 24 Hour Immersion
1. Citric Acid (1%), Rating: No Attack
 2. Lactic Acid (10%), Rating: Dulling, No Attack
 3. Sulfuric Acid (10%), Rating No Attack
 4. Isopropyl Alcohol (99%), Rating Chemical Damage
 5. Sodium Hydroxide (10%), Rating No Attack
 6. Sodium Carbonate (2%), Rating N Attack
 7. Sodium Hypochlorite (5%), Rating No Attack
 8. Mineral Oil, Rating No Attack
 9. Vegetable Oil, Rating No Attack

2.2 COVE BASE SYSTEM

- A. Epoxy cove base system by flooring manufacturer.
- B. 1/8 inch minimum thickness by 6" height or as indicated on Drawings.
- C. Applied in layers:
1. Primer
 2. Epoxy cove mortar
 3. Grout/ Seal coat

2.3 EDGE TRIM STRIPS

- A. Provide at exposed edges of floor coating where no walls surround.
- B. Formed aluminum, on one-piece width, same thickness as finish flooring, by two inch wide with tapered nose to accommodate different flooring thickness: PEMCO 173 or equal. At doorways, install under door.
1. Provide counter sunk screw fasteners to match.

PART 3. EXECUTION

3.1 EXAMINATION

- A. Examine surfaces and the DRAWINGS details to receive floor coating for defects that will adversely affect the work and for deviations beyond allowable tolerances.
- B. Verify that subfloor is structurally sound in accord with flooring manufacturer's recommendations.
- C. Verify building permanent ventilation system is operating.
- D. Start of work shall mean acceptance of interfacing surfaces as capable of producing acceptable work.

3.2 PREPARATION OF SURFACES

- A. Remove existing floor coating down to existing concrete.

- B. Prepare subfloor and wall base area in accord with floor coating manufacturer's recommendations: ASTM D4258, ASTM D4259 and these specifications.
- C. Clean using scraping or grinding to remove existing flooring and wall base area down to concrete substrate. Remove dirt, loose particles, oil, grease and other foreign material detrimental to the adhesion of new finish flooring.
 - 1. Abrasive blast substrate to coating manufacturer recommended profile.
- D. Remove or sand uneven joints and rough areas to flush.
- E. Fill holes and cracks over 1/4 inch with floor coating manufacturer approved filler.

3.3 APPLICATION

- A. Install coatings in accord with approved manufacturer's instructions, approved submittals, using floor coating manufacturer approved application materials including substrate temperature, primers, fillers, surface profile, number of coats, over-coating times anti slip granules.
- B. Install completed floor coating with smooth full coverage without blisters or waves, with evenly applied abrasive slip resistant granules.

3.4 BASE INSTALLATION

- A. Level with seamless transitions to flooring and completely adhered to vertical surfaces.

3.5 CLEAN UP

- A. Remove surplus materials, adhesive and installation compounds from flooring and adjacent materials caused by flooring installation.
- B. Leave completed flooring clean, ready for use.

3.6 PROTECTION

- A. Prevent rolling traffic for at least 72 hours after installation.
- B. Provide plywood under when moving heavy fixtures over flooring.

END OF SECTION

PAINTING AND COATING

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 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 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints, stains, varnishes, and other coatings.
- C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
 - 1. Mechanical and Electrical:
 - a. In finished areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
 - b. In finished areas, paint shop-primed items.
 - c. On the roof and outdoors, paint all equipment that is exposed to weather or to view, including that which is factory-finished.
 - d. Paint interior surfaces of air ducts and convactor and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
 - e. Paint dampers exposed behind louvers, grilles, and convactor and baseboard cabinets to match face panels.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Floors, unless specifically so indicated.
 - 6. Glass.
 - 7. Concealed pipes, ducts, and conduits.

1.03 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

- A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2016.
- B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2016.
- C. GreenSeal GS-11 - Paints, Coatings, Stains, and Sealers; 2015.
- D. ASTM D610 – Practice for Evaluating Degree of Rusting on Painted Steel Surfaces
- E. ASTM D714 – Test Method for Evaluating Degree of Blistering of Paints
- F. ASTM D 2485 – Test Methods of Evaluating Coatings for High Temperature Service
- G. ASTM D2486 – Test Method for Scrub Resistance of Wall Paints
- H. ASTM D5894 – Practice for Cyclic Salt Fog/UV Exposure of painted Metal.

1.05 SUBMITTALS

- A. See Division 1 for submittal procedures.
- B. Product Data: Provide complete list of all products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).
 - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
 - 2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.
- D. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.
- E. Certification: By manufacturer that all paints and coatings do not contain any of the prohibited chemicals specified; GreenSeal GS-11 certification is not required but if provided shall constitute acceptable certification.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Division 01 for additional provisions.
 - 2. Extra Paint and Coatings: 1 gallon of each color; store where directed.
 - 3. Label each container with color in addition to the manufacturer's label.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum 25 years documented experience.

- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 10 years experience.
- 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 in accordance with 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.

1.07 INDOOR AIR QUALITY

- A. Before painting inside building [coordinate with User to] operate building permanent ventilation system at maximum outdoor airflow before mixing and applying paint, and for minimum 72 hours after application.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.09 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- E. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
- F. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2. PRODUCTS

2.01 MANUFACTURERS

- A. Provide all paint and coating products from the same manufacturer to the greatest extent possible.
- B. Companies meeting the "Quality Assurance" criteria and these specifications.
- C. Substitutions: See Division 1.

2.02 PAINTS AND COATINGS - GENERAL

- A. Paints and Coatings: Conform to governing regulations including Federal and State requirements for pollution, safety and health. Maximum chemical pollutant emission volatile organic compounds (V.O.C.) for paints per USGBC LEED requirements.
- B. Provide compatible products in accordance with approved paint manufacturer including paint, varnish, stain, enamel, lacquer, fillers and related products for prime, intermediate and finish coats.
- C. Paints containing lead shall not be used.
- D. All products "Best Line - PREMIUM GRADE" for professional trade sales recommended by paint manufacturer for the conditions of use.
- E. Mixing
 - 1. Furnish ready-mixed products except as otherwise specified.
 - 2. Follow manufacturer's directions for field-mixing of pastes and powders.
 - 3. Follow manufacturer's directions for field-catalyzing components.
 - 4. Coatings shall have good flowing application properties, capable of drying, or curing free of streaks or sags and yielding finish specified.
- F. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Do not begin application of coatings until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- E. Test shop-applied primer for compatibility with subsequent cover materials.

- F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Gypsum Wallboard: 12 percent.
 - 2. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to coating application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- F. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
- H. Insulated Coverings to be Painted: Remove dirt, grease, and oil from canvas and cotton.
- J. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- K. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
- L. Interior Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- M. Glue-Laminated Beams: Prior to finishing, wash surfaces with solvent, remove grease and dirt.
- N. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- C. Apply products in accordance with manufacturer's instructions.
- D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- E. Apply each coat to uniform appearance.
- F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

- G. Sand wood and metal surfaces lightly between coats to achieve required finish.
- H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- J. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

- A. See Section 01400 - Quality Requirements, for general requirements for field inspection.

3.05 CLEANING

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

3.06 PROTECTION

- A. Protect finished coatings until completion of project.
- B. Touch-up damaged coatings after Substantial Completion.

3.07 SCHEDULE - PAINT SYSTEMS

- A. General
 - 1. For the purposes of 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 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 and Finish Schedule.
 - 5. Sherwin Williams products are referenced. Other manufacturers having similar specifications meeting Quality Assurance specifications may be used.
- B. Interior Coating Schedule
 - 1. Structure ceiling joists, beams and deck:
 - a. First Coat: waterborne acrylic dry fall 3 to 4.5 dry mils thick, white color egg-shell, Sherwin Williams "B42 W0002", or approved. Any factory painted decking shall be dulled by wire brushing or brush off blasting and welds and abrasions spot-primed.
 - b. Finish Second Coat: same as first coat.
 - 2. 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".
 - 3. Steel and Aluminum - Bare Unprimed and galvanized - dry use
 - a. One coat top coat compatible rust-inhibiting acrylic latex primer: Sherwin Williams "ProCryl B66".
 - b. 2 coats acrylic latex enamel, satin sheen: Sherwin Williams "B70".
 - 4. Steel Doors and Frames - Shop Primed: 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 top coat 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.
- 5. Steel - Galvanized - wet use areas
 - a. Same as exterior.
- 6. Gypsum Board:
 - a. Spot prime any stains with stain blocking primer sealer over stained area; Sherwin Williams "Quick Dry" B51 W08670, sealer primer surfacer, top coat 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 finish coat with uniform roller texture as approved in mockup.
- 7. Insulated Coverings - Cloth
 - a. One coat alkyd primer sealer.
 - b. 2 coats acrylic latex enamel, satin sheen.
- 8. Equipment Plywood Wall Backer: Two coats water base flat white color latex fire retardant enamel: Sherwin Williams Flame Control 20-20A, or approved.
- 9. Concrete Floors: (Mechanical Room Housekeeping Pads) (sealer hardener densifier) two coats clear penetrating liquid. Lithium silicate recommended for commercial concrete floor.
 - a. Sealer-Hardner-Densifier: Prosoco "Consolideck LS" or equal

3.08 SCHEDULE - COLORS

- A. Unless otherwise specified, 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.
- B. Paint surfaces visible behind vents, louvers, grilles and reveals in public areas: flat black.

END OF SECTION

COMMON WORK RESULTS FOR FIRE SUPPRESSION

PART 1. GENERAL

1.1 NOTIFICATION

- 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. Wet Pipe Sprinkler System.
- B. System Design, Materials, Installation, and Certification.
- C. System Supervision Alarms.

1.3 SCOPE DESCRIPTION

- A. Provide modifications to the wet automatic fire sprinkler system, hydraulically calculated to protect the entire facility, complete and in operating order. This fire protection system shall be in compliance with the contract documents, applicable codes and standards, as well as the Authority having jurisdiction.

1.4 CODES AND STANDARDS

- A. IBC Latest Adopted Edition.
- B. NEC Latest Adopted Edition.
- C. UPC Latest Adopted Edition.
- D. IMC Latest Adopted Edition.
- E. IFC Latest Adopted Edition.
- F. NFPA 13 Standard for the Installation of Sprinkler Systems, latest adopted edition.
- G. ASCE Standard 7, Minimum Design Loads for Buildings and Other Structures, latest adopted edition.

1.5 RELATED WORK

- A. Section 09 90 00 - Painting and Coating.
- B. Section 22 05 00 - Common Work Results for Plumbing.

C. Section 23 05 00 - Common Work Results for HVAC.

1.6 QUALITY ASSURANCE

- A. Unless otherwise noted, this is substantially a "performance" specification.
- B. Minimum qualifications of the contractor/subcontractor shall include the following:
 - 1. Specialist Firm: Company specializing in automatic fire protection/sprinkler systems, possessing a minimum of three years' experience with systems similar in nature to the type specified herein.
 - 2. Design Certification: Shop drawings shall be prepared by a person with a minimum certification of level II designer, supervised by a Licensed Professional Engineer or a level III or IV Fire Sprinkler Designer, certified by the National Institute for Certification in Engineering Technologies (NICET), in Fire Protection Engineering Technology Automatic Fire Sprinkler System Layout.
 - 3. Equipment and components: Bear the "UL" label or the "FM" approval marking.
 - 4. Maintain a complete stock of replacement parts.
 - 5. Remain on 24 hour call for emergency service.
 - 6. Maintain an office and telephone, with authorized representatives of the Fire Protection Contractor's firm, including the Designated Project Mechanical Sprinkler Supervisor, with a physical presence and address in Alaska.
 - 7. Bids of wholesalers, contractor or any firm whose principal business is not that of manufacturing and/or installing fire protection systems is not acceptable.

1.7 SUBMITTALS

- A. Submit under provisions of Division 1.
- B. Submit 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. An index shall be included with bookmarks and identifying tabs between sections.
- C. Submit contractor's qualifications, proof of 3 years' experience under this contractor's firm name, and references for at least 5 projects in Alaska of similar type, size, and complexity.
- D. Submit all written reviews and contractor responses to reviews to the Architect/Engineer.
- E. Submit product data.

1.8 COORDINATION REQUIRED

- A. The contractor shall examine the structural, architectural, mechanical, electrical and all other drawings relating to the building and plan his work accordingly. He shall check and verify all dimensions at the site before fabricating any portion of the system. Any discrepancies in piping and head locations resulting from failure to do so shall be corrected expeditiously to provide proper coordination of all trades.
- B. Coordinate work with that of other trades to ensure that adequate space is provided for all work, including requirements for serviceability and accessibility. Locate sprinkler heads to avoid conflict with light fixtures and other installed equipment.

1.9 MATERIALS HANDLING AND STORAGE

- A. Deliver, store, protect, and handle products to the site under provisions of Division 1. Deliver and store valves in manufacturer packaging with labeling in place. Prior to installation, piping onsite shall be wrapped with protective wrapping. Valves, piping, materials, and equipment shall be clean and new when system is accepted by the Owner.

PART 2. PRODUCTS

2.1 GENERAL

- A. Provide only new materials and equipment, which are standard products of a manufacturer regularly engaged in the manufacture of fire protection equipment.
- B. All products shall bear the "UL" label or "FM" listing and be specifically approved for fire protection application where they are used.

2.2 PIPING

- A. Wet Pipe Sprinkler Systems:
 - 1. Black steel piping, ASTM A135 schedule 10 or ASTM A795 schedule 40, UL Listed or FM Approved for fire sprinkler service.
 - 2. Piping may be roll-grooved, threaded, flanged, or welded for connection. All threaded pipe shall be schedule 40. No plain-end piping fitting connections are allowed.

2.3 GROOVED FITTINGS, COUPLINGS, AND MECHANICAL TEES

- A. Grooved Fittings shall be Victaulic, Gruvlok, or equal. Galvanized fittings shall accompany galvanized piping. Couplings and mechanical tees shall be standard painted Victaulic, Gruvlok, or equal.
- B. Slip-Fit fittings and couplings utilized for joining branch piping to new main piping shall not be allowed.
- C. Contractor shall follow the manufacturer's suggested methods to prepare, carefully, the ends for these fittings to prevent leakage or system breakdown.

2.4 THREADED PIPE FITTINGS

- A. Threaded pipe fitting for this system shall be cast iron 125# ANSI B16.4 or malleable iron 150# ANSI B16.3.

2.5 PIPE FLANGES

- A. Pipe flanges for this system shall be Cast Iron Class 125# ANSI B16.5.

2.6 PIPING HANGERS AND SUPPORTS

- A. Pipe hangers shall conform to NFPA 13 standards.

PART 3. EXECUTION**3.1 CONTRACTOR COORDINATION**

- A. The fire protection contractor shall coordinate his work with the work of all other trades to assure timely installation and efficient use of mechanical areas including but not limited to boiler rooms, fan rooms, and ceiling spaces.
- B. Any work installed without proper coordination shall be promptly removed and reinstalled in a manner to allow for a good practical arrangement of all items which need to be installed by all crafts involved.
- C. In case of coordination dispute, the Architect/Engineer shall be consulted and his decision shall be binding.
- D. All costs associated with coordination and arranging or rearranging of the fire protection system shall be borne by the affected contractor, without causing any additional expense to the Owner.

3.2 PIPING INSTALLATION

- A. Install piping to conserve building space and route piping around access panels and openings. Piping shall not restrict any access opening.
- B. Provide seismic protection for the piping system in accordance with NFPA 13 standards. Attach bracing to structure with through bolts, washers, and nuts. Provide clearance at all structural penetrations. Provide oversized escutcheon plates or flexible connections where sprinklers penetrate non-frangible ceiling membranes.
- C. When piping is supported from manufactured structural members, the Installation of pipe hangers shall comply with truss manufacturer's recommendations for hanger attachments and loading.
- D. When pipe hangers are attached to bar joist with wood top and bottom chords, chords shall be predrilled for fasteners, and fasteners shall maintain a minimum distance of 0'-6" from truss "panel points".
- E. Pipe hangers shall be "Rod and Ring" type hangers throughout. Piping hangers shall have a minimum of ½" of adjustment on each side of the hanger ring nut, to allow for piping grade adjustment in the future.
- F. All "beam clamp" type fasteners shall be installed with retainer straps and locking nuts.
- G. All Trapeze members shall be fastened to truss chords or structural members.

3.3 SYSTEM TEST

- A. Hydrostatically test renovation portions of the system in accordance with NFPA 13 standards.
- B. Test all system alarm actuations and alarms.
- C. 48-hour advance notice required for all tests to allow Owner's field representative to witness these tests.

3.4 PAINTING

- A. Refer to Division 9.

3.5 PROJECT CLOSEOUT

- A. The fire protection contractor shall submit a written affidavit at the completion of the system, stating that the fire protection system as installed complies with all referenced codes and standards, Local Fire Marshal's Office, and the Owner's Insurance Underwriters.
- B. Furnish Written Guarantee to the Owner, that materials installations are free from mechanical defects and guaranteeing to replace and repair any and all unsatisfactory and defective work and items, to the satisfaction of the Owner, in a timely manner, for a period of one year after final acceptance of the building by the Owner, and to be responsible for any damage caused to the premises for any such unsatisfactory work.
- C. The contractor shall respond within reasonable time, not to exceed 15 days to repair or replace latent or hidden defects at such time as they are discovered.

END OF SECTION

COMMON WORK RESULTS FOR PLUMBING

PART 1. GENERAL

1.1 NOTIFICATION

- 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 SCOPE

- A. All provisions of the Contract including the General and Supplementary Conditions and the General Requirements apply to this work.

1.3 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 01 of the specifications is to be specifically included as well as all related drawings.

1.4 RELATED WORK

- A. Related Work Specified Elsewhere:
 - 1. Fire Suppression Specifications: Division 21.
 - 2. Heating, Ventilating and Air Conditioning (HVAC) Specifications: Division 23.
 - 3. Electrical Specifications: Division 26.
 - 4. Motors and Connections: Division 26.
 - 5. Starters and Disconnects: 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, 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.

1.5 REFERENCED CODES - LATEST ADOPTED EDITION

- A. NFPA 13 Installation of Sprinkler Systems.
- B. NFPA 70 National Electrical Code (NEC).
- C. IMC International Mechanical Code.
- D. UPC Uniform Plumbing Code.
- E. IECC International Energy Conservation Code.
- F. IFC International Fire Code.
- G. IFGC International Fuel Gas Code.
- H. IBC International Building Code.

1.6 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 Owner and obtain a written receipt.

1.7 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.

1.8 OPERATING AND MAINTENANCE MANUALS

- A. See General Conditions and the General Requirements in Division 1 regarding Operating and Maintenance Manuals.
- B. Submit maintenance manuals to the Engineer covering all equipment, fixtures, devices, etc. installed by the Contractor.
- C. 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.
- D. 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 with a list of manufacturers recommended inspection and maintenance tasks, 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.

1.9 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 Owner 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 Owner 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 Owner 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 perform the various tests as specified and required by the Architect, Engineer and as required by applicable code, the State and local authorities. The Contractor shall furnish all labor, 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 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 the Contractor's 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 the 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 Owner, shall be repaired and/or replaced to the complete satisfaction of the Owner. Warranty 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. Contractor's One Year Warranty.
 - 3. All Manufacturers' Guarantees.
 - 4. 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 the Contractor's 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, piping, controls 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

2.1 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.

2.2 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.

2.3 ELECTRICAL MOTORS

- A. Motors: Furnish electric motors designed for the specific application and duty applied, and to deliver rated horsepower without exceeding temperature ratings when operated on power systems with a combined variation in voltage and frequency not more than + 10% of rated voltage. Motors for pumps and fans shall be selected to be non-overloading.

- B. Verify from the drawings and specifications the available electrical supply characteristics and furnish equipment that will perform satisfactorily under the conditions shown and specified.
- C. All motors for use with equipment with variable frequency drives shall be inverter ready motors. Verify compatibility and sizing of motor with variable frequency drive.
- D. Size motors for 1.15 service factor and not to exceed 40° C temperature rise above ambient.
- E. Fractional horsepower motors to have self-resetting thermal overload switch.
- F. Provide Premium Efficiency, motors for all three phase motors one horsepower and larger. Standard efficiency motors will not be acceptable.

PART 3. EXECUTION

3.1 DRAWINGS

- A. The drawings are partly diagrammatic, not necessarily showing all offsets or exact locations of piping, 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, and Electrical Drawings. Coordinate work under this section with that of all related trades.

3.2 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.

3.3 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.

3.4 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 two 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.

3.5 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.

3.6 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.

3.7 PAINTING

- A. Perform all of the following painting in accordance with provisions of Division 09 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.

3.8 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.

COMMON WORK RESULTS FOR PLUMBING

Division 22

Section 22 05 00

- 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, 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. Provide Seismic Restraint in Accordance with Specification Section 22 05 48.
- 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 PLUMBING

PART 1. GENERAL

1.1 NOTIFICATION

- 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 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

3.1 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.

3.2 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 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 were 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

METERS AND GAUGES FOR PLUMBING PIPING

PART 1. GENERAL

1.1 NOTIFICATION

- 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. Water Meters.
- B. Pressure Gauges and Pressure Gauge Taps.
- C. Thermometers and Thermometer Wells.

1.3 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

- A. Section 22 10 00 - Plumbing Piping: Installation of thermometer wells, pressure gauge tapings.

1.4 REFERENCES

- A. ASTM E1 - Specification for ASTM Thermometers.
- B. ASTM E77 - Verification and Calibration of Liquid-in-Glass Thermometers.
- C. AWWA C700 - Cold Water Meters - Displacement Type.
- D. AWWA C706 - Direct Reading Remote Registration Systems for Cold Water Meters.

1.5 SUBMITTALS

- A. Submit under provisions of Division 1.
- B. Product Data: Include list which indicates use, operating range, total range and location for manufactured components.
- C. Submit manufacturer's installation instructions under provisions of Division 1.

1.6 PROJECT RECORD DOCUMENTS

- A. Submit documents under provisions of Division 1.
- B. Accurately record actual locations of instrumentation.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Do not install instrumentation when areas are under construction, except for required rough-in, taps, supports and test plugs.

PART 2. PRODUCTS

2.1 MANUFACTURERS

- A. Terice.
- B. Marsh.
- C. Ashcroft.
- D. Enerpac.
- E. Sisco.
- F. Petersen.
- G. Weiss.
- H. Winters.
- I. Substitutions: In accordance with Division 1.

2.2 PRESSURE GAUGES

- A. 4½" diameter dial size with a flangeless cast aluminum case, stainless steel friction ring and glass window. Movement will be brass with a bronze bourdon tube and brass socket. Dial face will be white with black figures; pointer will be friction adjustable type. Accuracy will be ±1% of scale range, ASME B40.1 Grade 1A. All wetted parts shall be Lead-Free (PBF) meeting NSF/ANSI Standards 372 and 61. Model 600C as manufactured by Terice.

2.3 PRESSURE GAUGE TAPS

- A. Gauge Isolation Valve: Lever handle ball valve, forged brass body, chrome plated brass ball, viton o-rings for maximum 150 psig. Model Mini T-82-M as manufactured by Jomar or approved equal.
- B. Needle Valve: Brass for maximum 150 psig. Model 735 as manufactured by Terice or approved equal.
- C. Pulsation Damper: Pressure snubber, brass with 1/4 inch connections. Series 870 as manufactured by Terice or approved equal.

2.4 STEM TYPE THERMOMETERS

- A. 9 inch scale, universal adjustable angle, blue organic spirit fill, lens front tube, cast aluminum case with blue epoxy finish and clear acrylic window, extended brass stem, cast aluminum adjustable joint with positive locking device, 2 percent of scale accuracy to ASTM E77, scale calibrated in both degrees F and degrees C. BX9 series as manufactured by Terice.

2.5 THERMOMETER SUPPORTS

- A. Socket: Brass separable sockets for thermometer stems with or without extensions as required.

2.6 WATER METERS (LIQUID)

- A. Provide water meter in accordance with Anchorage Waste Water Utility (AWWU) Design and Construction Practices Manual, current edition.

2.7 FLOW INDICATORS

- A. Double window 316 stainless steel housing, female NPT connections. ABS impeller. Model 300SS by Anderson Midwest or approved equal.

PART 3. EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install water meters with strainer upstream and isolating valves on inlet and outlet. Provide pressure gauge downstream of check valve. Provide full line size valved bypass for liquid service meters.
- C. Size and install water meters in accordance with Anchorage Waste Water Utility (AWWU) Design and Construction Practices Manual, current edition. Coordinate meter installation with AWWU Field Service Supervisor.
- D. Install pressure gauges with pulsation dampers. Provide needle valve or gauge isolation valve to isolate each gauge.
- E. Provide two pressure gauges per pump, installing taps on suction and discharge of pump. Pipe to gauge with isolation valve to each tapping.
- F. Thermometers for measuring fluid temperatures shall have stems with insertion lengths of roughly half of the pipe diameter; minimum insertion length will be 2". Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2 inch for installation of thermometer sockets. Select bulb length to reach centerline of pipe. Thermometers installed on tanks will have a minimum insertion length of 5".
- G. Where insulation thickness exceeds 2", provide a longer stem thermometer with an extension neck, lead free brass (PBF) thermowell. The extension neck shall be at least 2" long.
- H. Coat thermometer stem with heat transfer paste prior to installing into the thermowell.
- I. Install thermometer sockets adjacent to controls system thermostat, transmitter, or sensor sockets.
- J. Provide instruments with scale ranges selected according to service with largest appropriate scale and range selected so that the operating temperature or pressure of the material being measured will fall approximately in the middle of the scale.

- K. Install gauges and thermometers in locations where they are easily read from normal operating level.

3.2 PRESSURE GAUGE SCHEDULE

LOCATION	SCALE RANGE
Pumps less than 40' TDH	0 - 30 PSIG
Pumps more than 40' TDH	0 - 60 PSIG
Domestic Water System	0 - 100 PSIG
Others	As applicable

3.3 STEM TYPE THERMOMETER SCHEDULE

LOCATION	SCALE RANGE
Domestic Cold water system	0 - 100°F
Domestic Hot Water Supply and Recirc.	0 - 200°F
Others	As applicable

END OF SECTION

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1. GENERAL

1.1 NOTIFICATION

- 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 WORK INCLUDED

- A. Piping and equipment hangers, supports, and associated anchors.
- B. Equipment bases and supports.
- C. Sleeves and seals.
- D. Flashing.

1.3 PRODUCTS FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

- A. Furnish hanger and support sleeves for placement into formwork.

1.4 RELATED WORK

- A. Division 3 - Cast in Place Concrete: Equipment Bases.
- B. Division 7 - Fire Stopping: Joint Seals for Piping Penetration of Fire Rated Assemblies.
- C. Division 9 - Painting.
- D. Section 22 05 00 - Common Work Results for Plumbing.
- E. Section 22 05 19 - Meters and Gages for Plumbing Piping.
- F. Section 22 05 48 - Vibration and Seismic Controls for Plumbing Piping and Equipment.
- G. Section 22 05 53 - Identification for Plumbing Piping and Equipment.
- H. Section 22 07 00 - Plumbing Insulation.
- I. Section 22 10 00 - Plumbing Piping.
- J. Section 22 30 00 - Plumbing Equipment.

1.5 REFERENCES

- A. ASME B31.1 - Power Piping.
- B. ASME B31.9 - Building Services Piping.
- C. ASTM F708 - Design and Installation of Rigid Pipe Hangers.
- D. ANSI/MSS SP58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
- E. ANSI/MSS SP69 - Pipe Hangers and Supports - Selection and Application.
- F. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable code for support of plumbing piping.

1.7 SUBMITTALS

- A. Submit under provisions of Division 1.
- B. Product Data: Provide manufacturers catalog data including load capacity. Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.

PART 2. PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS

- A. Acceptable Manufacturers:
 - 1. Anvil.
 - 2. Eaton.
 - 3. Erico.
 - 4. Holdrite.
 - 5. PHD Manufacturing, Inc.
- 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. Plumbing Piping - Water:
 - 1. Conform to ANSI/MSS SP58.

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

Division 22
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2. Hangers for Pipe Sizes ½ to 1-½ Inch: Malleable iron or carbon steel, adjustable swivel, split ring.
 3. Hangers for Cold Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
 4. Hangers for Hot Pipe Sizes 2 to 4 Inches: Carbon steel, adjustable, clevis.
 5. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 6. Multiple or Trapeze Hangers for Hot Pipe Sizes 6 Inches and Over: Steel channels with welded spacers and hanger rods, cast iron roll.
 7. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
 8. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
 9. Wall Support for Hot Pipe Sizes 6 Inches and Over: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.
 10. Vertical Support: Steel riser clamp.
 11. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 12. Floor Support for Hot Pipe Sizes to 4 Inches: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 13. Copper Pipe Support: Carbon steel ring, adjustable, copper plated with neoprene isolation pad.
- D. Design hangers to allow installation without disengagement of supported pipe.
- E. Copper Plating: All hanger elements in metal-to-metal contact with copper pipe shall have copper plating, hanger rings with factory-applied 1/16 inch minimum thick plastic, or tape cushion strip over all contact surfaces.
- F. Strut Type Pipe Hanging System: Unistrut P-1000 series; framing members shall be No. 12 gage formed steel channels, 1-5/8 inch square, conforming to ASTM A 570 GR33, one side of channel shall have a continuous slot with inturned lips; framing nut with grooves and spring 1/2 inch size, conforming to ASTM 675 GR60; screws conforming to ASTM A 307; fittings conforming to ASTM A 575; all parts enamel painted or electro-galvanized.
- G. 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.
- H. 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.
- I. Shields for Vertical Copper Pipe Risers: Galvanized steel pipe.

2.2 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

2.3 INSERTS

- A. Inserts: Malleable iron case of steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.4 ANCHOR BOLTS

- A. Anchor (Expansion) Bolts: Shall be carbon steel to ASTM A 307; nut shall conform to ASTM A194; shall be drilled-in type. Design values for shear and tension shall be not more than 80 percent of the allowable load.

2.5 EQUIPMENT CURBS

- A. Fabricate curbs of concrete or steel beam, unless specifically called out otherwise.

2.6 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. Curb Caps: Steel, 22 gauge minimum; 16 gauge at fire resistant elements.

2.7 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Floors: Form with 18 gauge galvanized steel for 4 inch diameter and larger, 22 gauge up to 3" diameter.
- B. 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.
- C. Sleeves for Pipes through Fire Rated and Fire Resistive Floors and Walls, and Fireproofing: Prefabricated fire rated sleeves including seals, UL listed caulking.
- D. Fire Stopping Insulation: Mineral fiber type, non- combustible.
- E. Caulk: Fire stop sealant in compliance with ASTM E814 and UL 1479. Refer to Division 7.
- F. 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.

2.8 FORMED STEEL CHANNEL

- A. Manufacturers:
 1. Atkore Allied Tube & Conduit Corp.
 2. Eaton B-Line Series.
 3. PHD Manufacturing, Inc.
 4. Substitutions under provisions of Division 1.

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

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- B. Product Description: Galvanized 12 gauge (2.8 mm) thick steel. With holes 1-1/2 inches (38 mm) on center.

PART 3. EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install pipe hangers in accordance with ANSI/MSS-SP-69.

3.2 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
Copper Tube and Pipe	Soldered or Brazed	1 1/2 inches and smaller, 6 feet; 2 inches and larger, 10 feet	Each floor, not to exceed 10 feet ⁵
Schedule 40 PVC and ABS DWV	Solvent Cemented	All sizes, 4 feet; allow for expansion every 30 feet ^{3,6}	Base and each floor' provide mid-story guides; provide for expansion every 30 feet ⁶

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.

- C. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
- D. Place a hanger within 12 inches of each horizontal elbow.
- E. Use hangers with 1-1/2 inch minimum vertical adjustment.
- F. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- G. Support riser piping independently of connected horizontal piping.
- H. Design hangers for pipe movement without disengagement of supported pipe.

- I. Provide copper plated hangers and supports for copper piping.
- J. Prime coat exposed steel hangers and supports. Refer to Division 9. Hangers and supports located in crawlspace, pipe shafts, and suspended ceiling spaces are not considered exposed.
- K. Provide Seismic restraint in accordance with Specification Section 22 05 48.

3.3 INSERTS

- A. Provide inserts for placement in concrete formwork.
- B. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
- D. Where concrete slabs form finished ceiling, provide inserts to be flush with slab surface.
- E. Where inserts are omitted, drill through concrete slab from below and provide thru-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

3.4 EQUIPMENT BASES AND SUPPORTS

- A. Provide equipment bases of were shown on plans and where required by equipment manufacturer installation instructions.
- B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct support of steel members. Brace and fasten with flanges bolted to structure.
- D. Provide housekeeping pads of concrete, Refer to Division 3.
- E. Provide rigid anchors for pipes after vibration isolation components are installed.
- F. Anchor (Expansion) Bolts: Install anchor bolts for all plumbing piping and equipment as required. Tightly fit and clamp base-supported equipment anchor bolts at all equipment support points. Provide locknuts where piping and equipment is hung. Install anchor (expansion) bolts in holes drilled in concrete where necessary to hang piping or equipment, or to anchor stationary equipment from existing concrete slabs.

3.5 FLASHING

- A. Provide flexible flashing and metal counter-flashing where piping penetrates weather or waterproofed walls, floors, and roofs. For pipes through outside walls, turn flanges back into wall and caulk, metal counter-flash and seal.
- B. Seal floor drains watertight to adjacent materials.
- C. Provide acoustical flashing around ducts and pipes penetrating equipment rooms, installed in accordance with manufacturer's instructions for sound control.

3.6 SLEEVES

- A. Set sleeves in position in construction. Provide reinforcing around sleeves.
- B. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- C. Extend sleeves through floors one inch above finished floor level. Pack and 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 area or occupancy separation 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

VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT

PART 1. GENERAL

1.1 NOTIFICATION

- 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 WORK INCLUDED

- A. This section provides minimum acceptance requirements for vibration isolation and seismic/wind restraints for all plumbing equipment and piping.

1.3 GENERAL

- A. The requirements for seismic protection measures to be applied to plumbing equipment and systems specified herein are in addition to any other items called for in other sections of these specifications.

1.4 PLUMBING EQUIPMENT AND PIPING

- A. New and existing plumbing equipment shall include the following items to the extent required on plans or in other sections of these specifications.
 - 1. Water Heaters.
 - 2. Storage Tanks.
 - 3. Domestic Water Piping.
 - 4. Drain, Waste and Vent Piping.

1.5 RELATED WORK SPECIFIED ELSEWHERE

- A. Concrete work is provided in Division 3.
- B. Seismic restraints for fire suppression systems are provided in Division 21.
- C. Vibration isolation and seismic/wind restraints for heating, fuel and ventilation systems are specified elsewhere in Division 23.
- D. Vibration isolation and seismic restraints for electrical systems are provided in Division 26.

1.6 QUALITY ASSURANCE

- A. The following codes and standards will apply:
 - 1. International Building Code.
 - 2. American Society of Civil Engineers (ASCE) 7-16.

- B. Manufacturer's Qualifications: Firms regularly engaged in manufacture of vibration control and wind restraint products of type, size, and capacity required, whose products have been in satisfactory use in similar service for not less than 5 years.
- C. The following guides may be used for supplemental information on typical seismic installation practices:
 - 1. Federal Emergency Management Agency (FEMA) manuals 412, Installing Seismic Restraints for Mechanical Equipment and 414, Installing Seismic Restraints for Ductwork and Pipe.
 - 2. Sheet Metal and Air-conditioning Contractors' National Association's (SMACNA) Seismic Restraint Manual Guidelines for Mechanical Systems.
 - 3. American Society for Heating, Refrigerating and Air-conditioning Engineers' (ASHRAE) A Practical Guide to Seismic Restraint.
 - 4. Manufacturers Standardization Society of the Valve and Fittings Industry MSS SP-127-2014a, Bracing for Piping Systems, Seismic - Wind - Dynamic, Design, Selection, Application.

1.7 COMPONENT IMPORTANCE FACTOR

- A. In order to identify systems requiring seismic restraint and to define those from which restraints may be excluded, utility components are assigned an ASCE 7 Importance Factor (I_p) on the basis of the following:

$I_p = 1.0$ All plumbing piping and equipment.

1.8 SUBMITTALS

- A. Submit shop drawings and manufacturer's data in accordance with Division 1.
- B. Provide calculations for selection of seismic/wind restraints in accordance with IBC and ASCE 7, certified by a qualified professional engineer, licensed in the state of the project.
- C. Submit adequate number of City Plan Review department set of shop drawings and seismic calculations for their review. Submit to City plan review and owner concurrently. Submit plan review approved set to Engineer when available. The submittals must include a licensed engineer's stamp and signature and shall be provided as deferred submittal.
- D. Provide Shop drawings along with catalog cuts, templates and erection and installation details, as appropriate, for the items listed. Submittals shall be complete in detail; shall indicate thickness, type, grade, class of metal; and dimensions; and shall show construction details, reinforcement, anchorage, and installation with relation to the building construction.

PART 2. PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Vibration isolators and Seismic Restraint shall be manufactured by:
 - 1. Amber/Booth.
 - 2. Cooper Industries.
 - 3. International Seismic Application Technology.
 - 4. Kinetics Noise Control.
 - 5. Mason Industries.
 - 6. Vibro-Acoustics.

7. Substitutions: Items of same function and performance are acceptable in conformance with Division 1.

2.2 SEISMIC BRACING AND SUPPORT OF SYSTEMS AND COMPONENTS

- A. General:
 1. Seismic restraint designer shall coordinate all attachments with the structural engineer of record.
 2. Design analysis shall include calculated dead loads, static seismic loads, and capacity of materials utilized for the connection of the equipment or system to the structure.
 3. Analysis shall detail anchoring methods, bolt diameter, and embedment depth.
 4. All seismic restraint devices shall be designed to accept without failure the forces calculated per the applicable building code and as summarized in installation requirements.
 5. The total height of the structure (h) and the height of the system to be restrained within the structure (z) shall be determined in coordination with architectural plans and the General Contractor.
- B. Friction from gravity loads shall not be considered resistance to seismic forces.

2.3 SEISMIC BRACING COMPONENTS

- A. Steel strut shall be 1-5/8 inch wide in varying heights and mig-welded combinations as required to meet load capacities and designs indicated. A material heat code, part number, and manufacturer's name shall be stamped on all strut and fittings to maintain traceability to material test reports.
 1. Material for epoxy painted strut: ASTM A1011, SS, Grade 33.
 2. Material for pre-galvanized strut: ASTM A653, SS, Gr. 33.
 3. Material for Hot-Dip Galvanized strut: ASTM A1011, SS, Grade 33 and hot-dip galvanized after fabrication in accordance with ASTM A123.
 4. Material for fittings and accessories: ASTM A907 Gr. 33, Structural Quality or ASTM A1011, SS, Gr.33.
 5. Fittings and accessories: Products shall be of the same manufacturer as strut and designed for use with that product.

2.4 SEISMIC BRACING AND RESTRAINT

- A. Provide positive attachment for seismic and wind restraints on those systems and components required by the applicable building code and by the local authority having jurisdiction.
- B. Provide restraint devices as required, specified, and as scheduled for isolated and non-isolated systems and equipment. Provide calculations to determine restraint loadings for all restrained systems and equipment resulting from seismic forces.
- C. Seismic Cable Restraints: Type BulletBrace™ - Preassembled Adjustable Seismic cable sway bracing restraints shall consist of 7x19 galvanized steel aircraft cable sized to resist seismic loads. Cable restraint system shall be completely preassembled to eliminate onsite assembly of restraint components and must allow quick and easy adjustment on the length of the cable after the installation to remove excessive sag on the cable. Cable end connections shall use heavy brackets, thimbles, and wire rope clips or compression sleeves.
- D. Rigid Restraints: Seismic rigid sway bracing restraints shall include heavy duty brackets made of high-strength, low alloy steel designed to provide enough strength to withstand seismic load. To prevent any confusion, brackets should be universal to be used for both

structure and equipment attachments and should accommodate post-installation of seismic restraints without the requirement of disassembling the hanger rod or any component of the equipment. No drilling should be required to secure rigid restraint brackets to the rigid brace, and rigid restraint system must include special grade hardware for attachments. Rigid restraint brackets must be color-coded for capacity identification.

- E. Hanger Rod Stiffener: Structural steel angle attached with a formed steel clamp (Type VAC) to threaded rod support. Steel angle to be provided by contractor; steel clamp to be provided by seismic restraint manufacturer.
- F. Seismic Inline Pump Stands: Trapezoidal-shaped rigid support stands made of high strength, low alloy steel designed to connect to pipe flanges which support vertical inline pumps. Stands shall include neoprene grommet washers for anchor bolts and be designed to provide adequate restraint for connected equipment to resist seismic loads. Provide vibration isolation pads under pump stands as shown on the schedule or details.
- G. Seismic Pipe Stand: (Adjustable Height) - rigid support pipe stands made of high-strength steel rigid restraints, low alloy designed to support the dead load, and provide enough strength to withstand at least 1 g of lateral seismic force. In addition to providing allowance for roof slopes, the adjustable height stands shall be used to accommodate changing pipe sizes.
- H. Seismic Restraint Brackets: Formed steel brackets for securing floor-mounted equipment complete with pre-drilled holes. Brackets shall be galvanized or powder coated enamel for corrosion protection.
- I. Seismic Snubber: Structural steel angle(s) with surfaces covered with ribbed neoprene pads to cushion contact with snubber. Customized snubber designs may use other structural shapes and configurations as required. Snubbers shall be designed to limit equipment motion to no more than 6 mm (1/4") in any direction.
- J. Concrete Anchors: Post-installed anchors in concrete shall be qualified for seismic/wind restraint application.
 - 1. Mechanical anchor bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. (In accordance with ACI 355.2 and ICC-ES AC193)
 - 2. Adhesive Anchor Bolts: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. (In accordance with ACI 355.4 and ICC-ES AC308)

PART 3. EXECUTION

3.1 GENERAL

- A. Coordinate size, doweling, and reinforcing of concrete equipment housekeeping pads and piers with vibration isolation and seismic restraint device manufacturer to ensure adequate space and prevent edge breakout failures. Pads and piers must be adequately doweled in to structural slab.
- B. Coordinate locations and sizes of structural supports with locations of vibration isolators and seismic/wind restraints (e.g., roof curbs, etc.).

- C. Isolated and restrained equipment and piping located on roofs must be attached to the structure. Intermediate supports between the restraint and structure that are not attached to the structure must be approved by the restraint manufacturer.

3.2 SEISMIC/WIND RESTRAINTS

A. General:

1. All equipment and piping shall be restrained to resist seismic/wind forces per the applicable building code(s) as a minimum. Restraint attachments shall be made by bolts, welds or a positive fastening method. Friction shall not be considered. All attachments shall be proven capable of accepting the required wind load by calculations. Additional requirements specified herein are included specifically for this project.
2. Install seismic and wind restraint devices per the manufacturer's submittals. Any deviation from the manufacturer's instructions shall be reviewed and approved by the manufacturer.
3. Attachment to structure for suspended equipment and pipe: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
4. Wall penetrations may be used as bracing locations provided the wall can provide adequate resistance without significant damage.
5. Coordinate sizes and locations of cast-in-place inserts for post-tensioned slabs with seismic restraint manufacturer.
6. Provide hanger rod stiffeners where indicated or as required to prevent buckling of rods due to seismic forces.
7. Where rigid restraints are used on equipment or piping, support rods for the equipment or piping at restraint locations must be supported by anchors rated for seismic use. Post-installed concrete anchors must be in accordance with ACI 355.2.
8. Ensure housekeeping pads have adequate space to mount equipment and seismic restraint devices and shall also be large enough to ensure adequate edge distance for restraint anchor bolts to avoid housekeeping pad breakout failure.

B. Concrete Anchor Bolts:

1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid pre- or post-tensioned tendons, electrical and telecommunications conduit, and gas lines.
2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Mechanical Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
5. Set anchors to manufacturer's recommended torque, using a torque wrench.

C. Equipment Restraints:

1. Seismically restrain equipment as indicated on the schedule. Install fasteners, straps and brackets as required to secure the equipment.
2. As indicated on the schedule, install seismic snubbers on HVAC equipment supported by floor-mounted, non-seismic vibration isolators. Locate snubbers as close as

- possible to vibration isolators and attach to equipment base and supporting structure as required.
 3. Install neoprene grommet washers on equipment anchor bolts where clearance between anchor and equipment support hole exceeds 1/8" (3.2 mm).
 4. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- D. Piping Systems:
1. For projects with a Seismic Design Category of D provide seismic cable restraints on the following:
 - a. All piping greater than 3" (75 mm) nominal diameter.
 - b. All piping systems assigned a component importance factor, I_p , of 1.5 with a nominal pipe diameter greater than 1" (25 mm) or trapeze-supported piping with combined operating weight over 10 lbs/ft (15 kg/m).
 2. "12-inch rule", where pipe can be exempted from seismic restraint based on the length of the support rods, is accepted if one of the following conditions are met:
 - a. Hangers are detailed to avoid bending of the hangers and their attachment; and provisions are made for piping to accommodate expected deflections. The maximum stress due to combined loading including bending in the hangers must be less than 21.6 ksi.
 - b. Isolation hangers are added to hanger rod to provide swivel joint and to prevent bending moment in hanger.
 3. Restraint spacing:
 - a. For ductile piping, space lateral supports a maximum of 40' (12 m) o.c., and longitudinal supports a maximum of 80' (24 m) o.c.
 - b. For non-ductile piping (e.g., cast iron, PVC) space lateral supports a maximum of 20' (6 m) o.c., and longitudinal supports a maximum of 40' (12 m) o.c.
 - c. For piping with hazardous material inside (e.g., natural gas, medical gas) space lateral supports a maximum of 20' (6 m) o.c., and longitudinal supports a maximum of 40' (12 m) o.c.
 - d. For pipe risers, restrain the piping at floor penetrations using the same spacing requirements as above.
 4. Brace a change of direction longer than 12' (3.7 m).
 5. Longitudinal restraints for single pipe supports shall be attached directly to the pipe, not to the pipe hanger.
 6. For supports with multiple pipes (trapezes), secure pipes to trapeze member with clamps approved for application.
 7. Piping on roller supports shall include a second roller support located on top of the pipe at each restraint location to provide vertical restraint.
- E. Install restraint cables so they do not bend across edges of adjacent equipment or building structure.
- F. Install flexible metal hose loops in piping which crosses building seismic joints, sized for the anticipated amount of movement.
- G. Install flexible piping connectors where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one supporting the connections as they approach equipment.
- H. Coordinate seismic restraints with thermal expansion compensators, guides and anchor points. Thermal expansion anchor points shall be designed to accommodate seismic forces.

END OF SECTION

IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1. GENERAL

1.1 NOTIFICATION

- 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 RELATED DOCUMENTS

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

1.3 SUMMARY

- A. Section Includes identification of plumbing piping and equipment installed under Division 22.
- B. Related Sections:
 - 1. Division 9 - Painting and Coating: Execution requirements for painting specified by this section.

1.4 REFERENCES

- A. ANSI/ASME A13.1 - Scheme for the Identification of Piping Systems.

1.5 SUBMITTALS

- A. Submit product data under provisions of Division 1.

1.6 QUALITY ASSURANCE

- A. Conform to ANSI/ASME A13.1 for color scheme for identification of piping systems and accessories.

PART 2. PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Seton.
- B. Marking Services Inc.
- C. Craftmark Identification Systems.

- D. Substitutions: Under provisions of Division 1.

2.2 MATERIALS

- A. Color: Unless specified otherwise, conform with ANSI/ASME A13.1.
- B. Plastic Nameplates: Laminated three-layer plastic with engraved black or white letters on contrasting background color. Plate size minimum $\frac{3}{4}$ " X 2- $\frac{1}{2}$ ".
- C. Plastic Tags: Laminated three-layer plastic with engraved black or white letters on contrasting background color. Tag size minimum 1- $\frac{1}{2}$ inch square.
- D. Metal Tags: Brass with stamped letters; tag size minimum 1- $\frac{1}{2}$ inch diameter with smooth edges.
- E. Stencils: With clean cut symbols and letters of following size:

Outside Diameter of Insulation or Pipe	Length of Color Field	Size of Letters
$\frac{3}{4}$ " - 1- $\frac{1}{4}$ "	8"	$\frac{1}{2}$ "
1- $\frac{1}{2}$ " - 2"	8"	$\frac{3}{4}$ "
2- $\frac{1}{2}$ " - 6"	12"	1- $\frac{1}{4}$ "
8" - 10"	24"	2- $\frac{1}{2}$ "
Over 10"	32"	3- $\frac{1}{2}$ "
Equipment	-----	2- $\frac{1}{2}$ "

- F. Stencil Paint: Semi-gloss enamel, colors and lettering size conforming to ANSI/ASME A13.1.
- G. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and fluid being conveyed. Larger sizes may have maximum sheet size with spring fastener.
- H. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.
- I. Valve Chart Frame: Aluminum frame with plastic windows.

PART 3. EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.
- B. Prepare surfaces in accordance with Division 9 for stencil painting.

3.2 INSTALLATION

- A. Apply stencil painting in accordance with Division 9.
- B. Install identifying devices after completion of coverings and painting.
- C. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.

IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

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- D. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer. For unfinished canvas covering, apply paint primer before applying labels.
- E. Install tags using corrosion resistant chain. Number tags consecutively by location.
- F. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.
- G. Identify water heaters, pumps, tanks, and water treatment devices with plastic nameplates or stencil painting. Identify in-line pumps and other small devices with tags.
- H. Identify control panels and major control components outside panels with plastic nameplates.
- I. Identify valves in main and branch piping with tags showing service and valve number.
- J. Identify piping, concealed or exposed, with plastic pipe markers or stenciled painting. Tags may be used on small diameter piping. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.
- K. Provide ceiling tacks to locate valves above T-bar type panel ceilings. Locate in corner of panel closest to equipment.
- L. Locations: Nameplates shall be located so as to be readily visible to maintenance personnel. Motor nameplates shall be readily visible on accessible, three phase motors, otherwise a duplicate motor nameplate shall be permanently affixed to the driven machinery in a visible locations.

3.3 VALVE CHART AND SCHEDULE

- A. Provide valve chart and schedule at location as directed. Chart shall show valve number, service and normal position. Provide a reduced scale copy of drawings showing valves and valve number. Provide copies of valve chart and drawings for inclusion in operation and maintenance manuals in accordance with Section 22 05 00.

END OF SECTION

PLUMBING INSULATION

PART 1. GENERAL

1.1 NOTIFICATION

- 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. Piping Insulation.
- B. Equipment Insulation.
- C. Jackets and Accessories.

1.3 RELATED WORK

- A. Division 9 - Painting: Painting Insulation Jacket.
- B. Section 22 05 00 - Common Work Results for Plumbing.
- C. Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment.
- D. Section 22 05 53 - Identification for Plumbing Piping and Equipment.
- E. Section 22 10 00 - Plumbing Piping.
- F. Section 22 30 00 - Plumbing Equipment.

1.4 REFERENCES

- A. ASTM B209 - Aluminum and Aluminum-alloy Sheet and Plate.
- B. ASTM C450 - Standard Practice for Fabrication of Thermal Insulating Fitting Covers for NPS Piping, and Vessel Lagging.
- C. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- D. ANSI/ASTM C533 - Calcium Silicate Block and Pipe Thermal Insulation.
- E. ANSI/ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.

- 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 Thermal Insulation.
- I. ANSI/ASTM C578 – Rigid, 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 - Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
- M. ASTM C1427 – Extruded Preformed Flexible Cellular Polyolefin Thermal Insulation in Sheet and Tubular Form.
- N. ASTM D635 - Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
- O. ASTM E84 – Test Method for Surface Burning Characteristics of Building Materials.
- P. ASTM E96 - Test Methods for Water Vapor Transmission of Materials.
- Q. UL 723 – Test for Surface Burning Characteristics of Building Materials.

1.5 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Include product description, thermal performance, thickness for each service, and locations.
- C. Submit manufacturer's installation instructions.

1.6 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, or ASTM E84.
- D. Factory fabricated fitting covers manufactured in accordance with ASTM C450.

1.7 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.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.

1.9 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

2.1 ACCEPTABLE MANUFACTURERS

- A. Armacell.
- B. Certain-Teed.
- C. IMCOA.
- D. Johns Manville.
- E. Knauf.
- F. Owens-Corning.
- G. Manson.
- H. Pittsburgh - Corning.
- I. K-Flex USA.
- J. Armstrong.
- K. Substitutions: Under provisions of Division 1.

2.2 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.

2.3 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.

2.4 INSULATION ACCESSORIES

- A. Adhesives: Waterproof and fire-retardant type.
- B. Canvas Lagging Adhesive: Fire resistive to ASTM E84 and UL 723.
- 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-2000 Calsil" or equal.

PART 3. EXECUTION

3.1 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.

3.2 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 insert fabricated of Johns Manville Thermo-12 or other heavy density insulating material suitable for temperature between support shield and piping on piping 1-½" inches diameter or larger. Insulation inserts shall not be less than the following lengths:

1-½" to 2-½" 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.

3.3 SCHEDULE – PIPING

PIPING	TYPE	PIPE SIZE Inch	MINIMUM INSULATION THICKNESS Inch
Domestic Cold Water	A	All Sizes	1"
Domestic Hot Water – Smaller than 1-1/2"	A	All Sizes	1"
Domestic Hot Water – 1-1/2" and Larger	A	All Sizes	1-1/2"

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PIPING	TYPE	PIPE SIZE Inch	MINIMUM INSULATION THICKNESS Inch
Domestic Hot Water Recirculated – Smaller than 1-1/2"	A	All Sizes	1"
Domestic Hot Water Recirculated – 1-1/2" and Larger	A	All Sizes	1-1/2"
Rain Leaders	A	All Sizes	1"

END OF SECTION

PLUMBING PIPING

PART 1. GENERAL

1.1 NOTIFICATION

- 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 WORK INCLUDED

- A. Sanitary Sewer Piping.
- B. Water Piping.
- C. Valves.
- D. Backflow Preventers.
- E. Dielectric Connections.
- F. Thermostatic Mixing Valves.

1.3 RELATED WORK

- A. Section 22 05 00 - Common Work Results for Plumbing.
- B. Section 22 05 19 - Meters and Gages for Plumbing Piping.
- C. Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment.
- D. Section 22 05 53 - Identification for Plumbing Piping and Equipment.
- E. Section 22 07 00 - Plumbing Insulation.
- F. Section 22 30 00 - Plumbing Equipment.

1.4 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.

1.5 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Include data on pipe materials, pipe fittings, valves and accessories.

1.6 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of piping, valves, and components.
- B. Disinfection and Test reports: Submit to owner for approval. Include all disinfection and testing reports in O&M manuals.

1.7 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

2.1 SANITARY SEWER 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 SD 4000 or approved equal.
- B. Copper Pipe: ASTM B306, DWV. Fittings: ASME B16.3, cast bronze, or ASME B16.29, wrought copper. Joints: ASTM B32, solder, Grade 95TA; Flux: ASTM B813.
- C. ABS Schedule 40 Cellular Core (Foam Core) Pipe: Pipe and fittings shall be manufactured from ABS compound with a cell class of 42222 for pipe and 32222 for fittings as per ASTM D 3965 and conform with National Sanitation Foundation (NSF) standard 14. ASTM D 2661 Fittings. Joints: ASTM D 2235 solvent welded. Installation of ABS piping in return air plenums is prohibited.

2.2 DOMESTIC WATER PIPING

- A. Copper Tubing: ASTM B88, Type L, hard drawn.
 - 1. Fittings: ASME B16.18, cast copper alloy, or ASME B16.22, wrought copper.
 - 2. Joints: ANSI/ASTM B32, solder, Grade 95TA; Flux: ASTM B813 or Press-Fit.
 - 3. Press Fittings: The press fittings connections shall be compatible with seamless K, L or M copper tube made to ASTM B 88. Fittings shall comply with NSF 61, CSA and the UPC. The Fittings shall have a maximum non-shock working pressure of 200 PSI between the temperatures of -20°F and +250°F. Elastomeric seals shall be made of EPDM material. Acceptable manufacturers: Viega ProPress or Nibco Press System.

2.3 STORM DRAIN PIPING

- A. Cast Iron Pipe: CISPI 301, hubless, service weight. Fittings: Cast iron. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies, Husky Series SD 4000 or approved equal.
- B. ABS Schedule 40 Cellular Core (Foam Core) Pipe: Pipe and fittings shall be manufactured from ABS compound with a cell class of 42222 for pipe and 32222 for fittings as per ASTM D 3965 and conform with National Sanitation Foundation (NSF) standard 14. ASTM D 2661 Fittings. Joints: ASTM D 2235 solvent welded. Installation of ABS piping in return air plenums is prohibited.

2.4 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.

2.5 ACCEPTABLE MANUFACTURERS - DIELECTRIC CONNECTIONS

- A. Elster Perfection - Clearflow.
- B. Substitutions: Under provisions of Division 1.

2.6 DIELECTRIC CONNECTIONS

- A. Dielectric Connections: Dielectric waterway fitting shall have zinc electroplated steel casing with polypropylene inner lining to provide a dielectric waterway. The fitting shall be designed to meet requirements of ASTM F1545 for continuous use at temperatures up to 225°F and for pressures up to 300 psi. IAPMO, UPC and NSF-61 listed for use with potable water.

2.7 ACCEPTABLE MANUFACTURERS - ALL VALVE TYPES

- A. Apollo.
- B. FNW.
- C. Hammond.
- D. Milwaukee.
- E. NIBCO.
- F. Red-White Valve Corp.
- G. Substitutions: Under provisions of Division 1.

2.8 GATE VALVES

- A. Not permitted. Use ball valves or butterfly valves for isolation service.

2.9 BALL VALVES

- A. Up to 2 Inches: 600 PSI CWP Lead free bronze two-piece body, full port, forged lead free brass ball, Teflon seats and adjustable packing, lever handle, solder, threaded or press-fit ends.
- B. Over 2 Inches: Cast steel, two piece body, full port chrome plated steel ball, Teflon seat and stuffing box seals, lever handle, flanged, solder, threaded or press-fit ends.

2.10 BUTTERFLY VALVES

- A. High Performance (Double Offset) Butterfly Valves:
 - 1. Body: One-piece wafer, lug or double flanged design with extended neck to allow for 2" of piping insulation. ASME 150 Flange. Provided with top and bottom stem bearings consisting of a 316 stainless steel shell with a TFE/glass fabric liner bearing surface. Equipped with an externally adjustable stem packing system that allows packing adjustment without removing the actuator. Internal over-travel stop shall be provided to prevent over-travel of the disc and minimize possible seat damage.
 - 2. Disc: Disc edge shall be hand polished for minimum torque and maximum sealing capability.
 - 3. Stem: One-piece design provided with blow-out proof stem retention system to assure full retention of the stem in the unlikely event of an internal stem failure.
 - 4. Seat: Design shall consist of a resilient energizer totally encapsulated by the seat. Seat retainer shall be full-faced and firmly attached by bolts located outside the sealing area to protect them from corrosion. The seat assembly shall be locked in the body recess by the full-faced retainer. The seat shall be self-adjusting for wear and temperature changes. The seat shall be easily field replaceable.
 - 5. Valve shall be tested for tight shut-off per API 598 requirements.
 - 6. ANSI/NSF 61/372 Certification.
 - 7. Provide with multi position valve operator/lever handle.
 - 8. Bray/McCannalok High Performance Butterfly Valve or Approved Equal.

2.11 SWING CHECK VALVES

- A. Up to 2 Inches: 200 PSI CWP lead free bronze swing with PTFE disc, solder, screwed or press-fit ends.
- B. Over 2 Inches: 285 PSI CWP ductile iron body, stainless steel trim, swing disc, renewable disc and seat, flanged ends.

2.12 SPRING LOADED CHECK VALVES

- A. Up to 2 inches: 250 PSI CWP Lead free bronze spring loaded with PTFE seat, solder, screwed or press fit ends.
- B. Over 2 inches: 200 PSI CWP Cast iron body, bronze trim, spring loaded, renewable composition disc, wafer, flanged ends.

2.13 WATER PRESSURE REDUCING VALVES

- A. Up to 2 Inches: Lead free cast copper silicon alloy, stainless steel and thermoplastic internal parts, reinforced EPDM diaphragm and valve disk, stainless steel strainer, NPT or solder ends. Watts Regulator LF123LP series or approved equal.

- B. Over 2 Inches: Direct operated water pressure reducing valve shall be constructed using Lead Free materials. Cast iron body, stainless steel internal parts with diaphragm rated to 200 PSI maximum working pressure. Watts Regulator Series 2300 or approved equal.

2.14 PRESSURE RELIEF VALVES

- A. Lead free copper alloy body, stainless steel spring, silicone disc, direct pressure actuated, capacities ASME certified and labeled, test lever, NPT ends.

2.15 PRESSURE AND TEMPERATURE RELIEF VALVES

- A. Lead free copper silicon alloy body construction, NPT male inlet and NPT female outlet connections, extended thermostat with thermo-bonded coating and test lever. Temperature relief setting of 210 degrees F and pressure relief range of 75 to 100 psi. Watts LF1XL or approved equal.

2.16 VACUUM RELIEF VALVES

- A. The vacuum relief valve shall be ANSI Z21.22 rated and CSA certified. The vacuum relief valve shall have a lead-free all brass body, Silicone Disc, Buna-N Oring, 302 Stainless Steel spring, Glass Filled Polysulfone Float, and polypropylene cover for automatic venting of a closed system to atmosphere when a vacuum is created. Maximum steam working pressure: 15 psi, Maximum temperature: 250°F. Watts LFN36-M1 or approved equal.

2.17 BALANCE VALVE

- A. NSF 61 compliant lead-free brass body rated for 300 PSIG working pressure, temperature range shall be from -4°F to 250°F, type 304 Stainless Steel ball valve. Valve body shall include two pressure/temperature ports, a drain valve port and a calibrated nameplate with a memory stop. NPT or sweat end connections.

2.18 ACCEPTABLE MANUFACTURERS - BACKFLOW PREVENTERS

- A. Watts Regulator.
- B. Febco.
- C. Colt.
- D. Substitutions: Under provisions of Division 1.

2.19 BACKFLOW PREVENTERS

- A. General: Backflow preventers shall conform to the applicable requirements of AWWA C510. Furnish a certificate of Full Approval or a current Certificate of Approval for each design, size, and make of backflow preventer being provided for the project. The certificate shall be from the Foundation for Cross- Connection Control and Hydraulic Research, University of Southern California, and shall attest that this design, size, and make of backflow preventer has satisfactorily passed the complete sequence of performance testing and evaluation for the respective level of approval. A Certificate of Provisional Approval is not acceptable in lieu of the above. IAPMO (UPC) approved.
- B. Boiler Dual Check Valve with Atmospheric Vent: The valve shall be constructed of stainless steel with rubber internals protected by an integral strainer. Primary check shall be rubber to

rubber seated, backed by the secondary check with rubber to metal seating. The device shall be ASSE Std. 1012. Watts Regulator Series 9D or approved equal.

2.20 ACCEPTABLE MANUFACTURERS - WATER HAMMER ARRESTORS

- A. J.R. Smith.
- B. Zurn.
- C. Mifab.
- D. Substitutions: Under provisions of Division 1.

2.21 WATER HAMMER ARRESTORS

- A. ANSI A112.26.1; sized in accordance with PDI WH-201, pre-charged suitable for operation in temperature range -100°F to 300°F and maximum 250 psig working pressure; Series 5000 manufactured by J.R. Smith or approved equal.

2.22 DRAIN VALVES

- A. Bronze body, chrome plated brass ball, RPTFE seals and stuffing box ring, stainless steel handle with vinyl cover. 3/4" NPT x 3/4" Hose thread, with duct cover and chain, sweat ends. Apollo 78-100 Series or approved equal.

2.23 ACCEPTABLE MANUFACTURERS - TEMPERING VALVES

- A. Cash Acme.
- B. Powers.
- C. Watts Regulator.
- D. Lawler Manufacturing Company.
- E. Symmons Industries Inc.
- F. Webstone.
- G. Substitutions: Under provisions of Division 1.

2.24 TEMPERING VALVE

- A. Lead free digital water temperature control and monitoring system with full-color touchscreen interface that is field configurable without any factory pre-programming.
- B. System shall control water temperature to $\pm 2^{\circ}\text{F}$ in accordance with ASSE 1017 and during periods of low/zero demand and feature a user-programmable high temperature alarm. Unit shall feature Feed Forward or Predictive Control which anticipates changes in system demand and adjusts valve pre-emptively to maintain mixed set point. Controller shall be password protected and feature a user-adjustable outlet temperature range of 80 - 180°F and an approach temperature of 2°F.
- C. System shall digitally monitor inlet pressure and temperature, mixed outlet temperature, mixed outlet set point, pressure and flow, as well as return temperature without the use of an external module.

- D. Controller shall integrate with building automation systems through Bacnet and Modbus protocols and feature local and remote temperature alarms. System will also feature a user-set and controlled, high-temperature sanitization mode for use as part of user's safe and properly designed thermal bacteria eradication protocol. In the event of a power failure or loss of cold water, system will close the hot water supply.
- E. System shall be listed/approved to ASSE 1017, cUPC, NSF and CSA 24/UL873 and should be mounted on a heavy-duty welded strut with corrosion resistance coating and factory tested as a complete unit.

PART 3. EXECUTION

3.1 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.

3.2 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. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- J. Prepare pipe, fittings, supports, and accessories not prefinished, ready for finish painting. Refer to Division 9.
- K. Establish invert elevations, slopes for drainage to 1/4" per foot, 1/8" per foot if 4" or over, minimum. Maintain gradients.
- L. Install valves with stems upright or horizontal, not inverted.
- M. Provide properly sized handles for valve operation. Handles shall not be cut or bent to make fit where installed.

- N. Install water hammer arrestors complete with accessible isolation valve.
- O. Press Fittings shall be installed in accordance with the manufacturer's installation instructions.
- P. 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.
- Q. Install tempering valve in accordance with the manufacturer's installation instructions.

3.3 APPLICATION

- A. Install unions downstream of valves and at equipment connections.
- B. Install ball or butterfly valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- C. Install balance valve valves for flow control services.
- D. Provide spring loaded check valves on discharge of water pumps.
- E. Use grooved mechanical couplings and fasteners only in accessible locations.

3.4 TESTING

- A. Test all water piping in accordance with Section 609 of the UPC. Submit a signed statement to the Engineer stating testing dates, procedure and initials of tester. The test pressure for a hydrostatic test shall be 1.5 times the design pressure or 150 psi, whichever is greater, and for an air test shall be 1.1 times the design pressure or 150 psi, whichever is greater.
- B. Test all sanitary sewer and vent piping in accordance with Section 712 of the UPC. Submit a signed statement to the Engineer stating testing dates, procedure and initials of tester.
- C. 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.
- D. Plastic piping tests are to be performed hydrostatically in accordance with manufacturer installation manuals. For polypropylene piping submit all testing results and documentation to manufacturer as required for manufacturer Warranty.

3.5 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Flush, clean and disinfect the potable water system in accordance with Section 609 of the UPC. Submit a signed statement to the Engineer stating disinfection dates, procedure and initials of tester.

3.6 SERVICE CONNECTIONS

- A. Provide new water service complete with reduced pressure backflow preventor and water meter with by-pass valves. Provide 18 gauge galvanized sheet metal sleeve around service main to 6 inch above floor. Size for minimum of 2 inches of loose batt insulation stuffing. Provide close fitting galvanized sheet metal escutcheon.

END OF SECTION

PLUMBING EQUIPMENT

PART 1. GENERAL

1.1 NOTIFICATION

- 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 WORK INCLUDED

- A. Packaged Water Heating Systems.
- B. Expansion Tanks.
- C. Domestic Hot Water Storage Tanks.
- D. Pumps.

1.3 RELATED WORK

- A. Section 22 05 00 - Common Work Results for Plumbing.
- B. Section 22 05 19 - Meters and Gages for Plumbing Piping.
- C. Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment.
- D. Section 22 05 53 - Identification for Plumbing Piping and Equipment.
- E. Section 22 07 00 - Plumbing Insulation.

1.4 QUALITY ASSURANCE

- A. Provide pumps with manufacturer's name, model number, and rating/capacity identified.
- B. Ensure products and installation of specified products are in conformance with recommendations and requirements of the following organizations:
 - 1. American Gas Association (AGA).
 - 2. National Sanitation Foundation (NSF).
 - 3. American Society of Mechanical Engineers (ASME).
 - 4. National Board of Boiler and Pressure Vessel Inspectors (NBBPVI).
 - 5. National Electrical Manufacturers' Association (NEMA).
 - 6. Underwriters Laboratories (UL).

- C. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, operate within 25 percent of midpoint of published maximum efficiency curve.

1.5 REGULATORY REQUIREMENTS

- A. Conform to NSF requirements for water heaters.
- B. Conform to ANSI/ASME Section 8D for manufacture of pressure vessels for heat exchangers.
- C. All materials utilized in domestic water system shall be certified by an ANSI accredited organization to conform to ANSI/NSF Standard 61.
- D. Conform to ASME Section IV Part HLW for Storage Tank construction.

1.6 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Include dimension drawings of water heaters indicating components and connections to other equipment and piping.
- C. Include dimensions of tanks, tank lining methods, anchors, attachments, lifting points, tappings, and drains.
- D. Indicate pump type, capacity, materials of construction, power requirements, and affected adjacent construction.
- E. Submit manufacturer's installation instructions under provisions of Division 1.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Division 1.
- B. Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.

1.8 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. Provide temporary inlet and outlet caps. Maintain caps in Place until installation.

1.9 WARRANTY

- A. Provide warranty under provisions of Division 1.
- B. In addition to warranty requirements of Division 1, the packaged water heating system heat exchanger shall carry a 5-year warranty, and all other parts/components shall carry an 18-month warranty against mechanical failure or workmanship from the date of shipment.

- C. In addition to warranty requirements of Division 01, the water storage tank shall include a 15-year full coverage for manufacturing or material defects, leaks, the production of rusty water and or chloride stress corrosion cracking. Tank warranty shall not require inspection and maintenance of anode rods. The warranty shall begin at the date of installation.

PART 2. PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - PACKAGED WATER HEATING SYSTEM

- A. Aerco.
- B. Cemline.
- C. Hubbell.
- D. Substitutions: Under provisions of Division 1.

2.2 PACKAGED WATER HEATING SYSTEM

- A. Packaged heat exchanger water heating system with counter-current flow stainless steel, brazed plate double wall heat exchanger designed and manufactured in accordance with ASME Code Section VIII, Div. 1 for 150 psig @ 250 °F. The heat exchanger shall have an air gap between plate walls, enabling visible leak detection. The plates shall be AISI 316 stainless steel.
- B. Connections shall include a domestic water inlet, domestic water outlet, boiler water inlet, boiler water outlet, and boiler water bypass.
- C. All electronic components shall be protected with an enclosure comprising of stainless steel and carbon steel sheet metal with powder coat finish. The enclosure shall not restrict access to any parts or components.
- D. The heater shall maintain +/- 4°F Max temperature fluctuation from setpoint at 0% to 100 % load at a constant load and +/- 4°F under normal diversified domestic load conditions.
- E. The system shall consist of a 3-way electronic control valve, control panel enclosure housing a PID temperature controller with digital indication of domestic hot water outlet temperature, domestic hot water inlet temperature, boiler water inlet temperature, digital over-temperature limit switch with audible alarm, domestic water pressure differential across the heat exchanger, and feed-forward flow meter. In an over-temperature condition, the controller shall close the control valve.
- F. The electronic control valve shall be of equal percentage flow characteristics. The valve shall have the following performance characteristics:
 - 1. Electronic Actuator with Fail Closed Design, particularly on loss of power.
 - 2. Time to Full Open Position: 3 seconds
 - 3. Time to Full Closed Position: 3 seconds
- G. The PID temperature controller shall be capable of RS-485 MODBUS or BACnet communications protocol for interoperability with Building Automation Systems (BAS).
- H. The following information shall be accessible locally at the controller or remotely via the communications port:

1. Unit Status
2. DHW Setpoint – can be changed remotely.
3. DHW Outlet Temperature
4. DHW Inlet Temperature
5. DHW Flow
6. DHW Pressure Drop
7. Boiler Inlet Temperature
8. Valve Position

- I. Each heater shall include a device to measure pressure differential across the domestic water side of the heat exchanger.
- J. Each heater shall be supplied by the manufacturer ready to accept existing boiler water and domestic water lines, and furnished with the following accessories:
 1. Y-strainers with blowdown valve for boiler water and domestic water.
 2. ASME Section VIII bronze pressure relief valve.
 3. Bronze ball type isolation valves.

2.3 ACCEPTABLE MANUFACTURERS – DOMESTIC WATER THERMAL EXPANSION TANKS

- A. Amtrol.
- B. Taco.
- C. Bell & Gossett.
- D. Substitutions: Under provisions of Division 1.

2.4 DOMESTIC WATER THERMAL EXPANSION TANKS

- A. Construction: Welded steel, constructed, tested and stamped in accordance with Section VIII, Division 1 of the ASME Code for a working pressure of 150 PSIG; factory air pre-charged and field adjustable. All welds conforming to ASME Section IX. All internal parts must comply with FDA regulations and approvals.
- B. The tank shall be supported by steel legs or a base (integral ring mount) for a vertical installation and include seismic restraint tabs.
- C. Each tank shall have a steel shell and an internal butyl/EPDM diaphragm or butyl bladder to isolate the air charge from fluid.
- D. Accessories: Pressure gauge and air-charging fitting, tank drain; precharge to incoming domestic water supply pressure.

2.5 ACCEPTABLE MANUFACTURERS - DOMESTIC HOT WATER STORAGE TANKS

- A. Aerco.
- B. PVI.
- C. Substitutions: Under provisions of Division 1.

2.6 DOMESTIC HOT WATER STORAGE TANKS

- A. The storage tank shall be ASME HLW stamped and National Board Registered for a maximum allowable working pressure of 150 psi and pressure tested at 1-1/2 times working pressure.
- B. Connection sizes shall be 2" NPT. Tank shall include a 1" drain valve. Tank shall include a 1" NPT relief valve opening.
- C. The storage tank shall be an unlined pressure vessel constructed from phase-balanced austenitic and ferritic duplex steel with a chemical structure containing a minimum of 21% chromium to prevent corrosion and mill certified per ASTM A 923 Methods A to ensure that the product is free of detrimental chemical precipitation that affects corrosion resistance. The material selected shall be tested and certified to pass stress chloride cracking test protocols as defined in ISO 3651-2 and ASTM G123 – 00 (2005) "Standard Test Method for Evaluating Stress-Corrosion Cracking of Stainless Alloys with Different Nickel Content in Boiling Acidified Sodium Chloride Solution."
- D. Waterside surfaces shall be welded internally utilizing joint designs to minimize volume of weld deposit and heat input. All heat affected zones (HAZ) shall be processed after welding to ensure the HAZ corrosion resistance is consistent with the mill condition base metal chemical composition. Weld procedures (amperage, volts, welding speed, filler metals and shielding gases) utilized shall result in a narrow range of austenite-ferrite microstructure content consistent with phase balanced objectives for welds, HAZ and the base metal.
- E. All internal and external tank surfaces shall undergo full immersion passivation and pickling processing to meet critical temperature, duration and chemical concentration controls required to complete corrosion resistance restoration of pressure vessel surfaces. Other passivation and pickling methods are not accepted. Immersion passivation and pickling certification documents are required and shall be provided with each product.
- F. The storage tank shall be completely factory packaged on a single skid, requiring only job site hookup to plumbing.
- G. Pressure relief valve rated to 150 PSI shall be factory installed.
- H. Materials shall meet ASME Section II material requirements and be accepted by NSF 61 for municipal potable water systems. Storage tank materials shall contain more than 80% post-consumer recycled materials and be 100% recyclable.
- I. Water contacting tank surfaces will be non-porous and exhibit 0% water absorption.
- J. Lined or plated storage tanks will not be acceptable.
- K. The storage tank will not require anodes.

2.7 ACCEPTABLE MANUFACTURERS - IN-LINE CIRCULATOR PUMPS

- A. Grundfos.
- B. Taco.
- C. Substitutions: Under provisions of Division 1.

2.8 IN-LINE CIRCULATOR PUMPS

- A. Casing: Bronze, rated for 125 psig working pressure.
- B. Impeller: Bronze.
- C. Shaft: Alloy steel with integral thrust collar and two oil lubricated bronze sleeve bearings.
- D. Seal: Carbon rotating against a stationary ceramic seat.
- E. Drive: Flexible coupling.

PART 3. EXECUTION

3.1 PACKAGED WATER HEATER INSTALLATION

- A. Install water heaters in accordance with manufacturer's instructions, NSF and UL requirements.
- B. Coordinate with plumbing piping and related electrical work to achieve operating system.
- C. Pipe relief valves and drains to nearest floor drain or six inches above finished floor.
- D. Connect 3-way valve bypass piping to boiler return.

3.2 DOMESTIC HOT WATER STORAGE TANK INSTALLATION

- A. Install tanks in accordance with manufacturer's instructions.
- B. Provide support for tanks, independent of building structural framing members.
- C. Clean and flush tank after installation. Seal until pipe connections are made.

3.3 PUMP INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide line sized ball valve and strainer on suction and line sized soft seated check valve and globe valve on discharge.

END OF SECTION

COMMON WORK RESULTS FOR HVAC

PART 1. GENERAL

1.1 NOTIFICATION

- 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 SCOPE

- A. All provisions of the Contract including the General and Supplementary Conditions and the General Requirements apply to this work.

1.3 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.

1.4 RELATED WORK

- A. Related Work Specified Elsewhere:
 - 1. Fire Suppression Specifications: Division 21.
 - 2. Plumbing Specifications: Division 22.
 - 3. Electrical Specifications: Division 26.
 - 4. Motors and Connections: Division 26.
 - 5. Starters and Disconnects: 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.

1.5 REFERENCED CODES - LATEST ADOPTED EDITION

- A. NFPA 13 Installation of Sprinkler Systems.
- B. NFPA 70 National Electrical Code (NEC).
- C. IMC International Mechanical Code.
- D. UPC Uniform Plumbing Code.
- E. IECC International Energy Conservation Code.
- F. IFC International Fire Code.
- G. IFGC International Fuel Gas Code.
- H. IBC International Building Code.

1.6 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 Owner and obtain a written receipt.

1.7 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.

1.8 OPERATING AND MAINTENANCE MANUALS

- A. See General Conditions and the General Requirements in Division 1 regarding Operating and Maintenance Manuals.
- B. Submit maintenance manuals to the Engineer covering all equipment, fixtures, devices, etc. installed by the Contractor.
- C. 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. 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.
- D. 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 with a list of manufacturers recommended inspection and maintenance tasks, 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.

1.9 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 Owner 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 Owner 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 Owner 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 perform the various tests as specified and required by the Architect, Engineer and as required by applicable code, the State and local authorities. The Contractor shall furnish all labor, 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 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 the Contractors 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 the 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 the Contractors 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

2.1 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.

2.2 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.

2.3 ELECTRICAL MOTORS

- A. Motors: Furnish electric motors designed for the specific application and duty applied, and to deliver rated horsepower without exceeding temperature ratings when operated on

power systems with a combined variation in voltage and frequency not more than + 10% of rated voltage. Motors for pumps and fans shall be selected to be non-overloading.

- B. Verify from the drawings and specifications the available electrical supply characteristics and furnish equipment that will perform satisfactorily under the conditions shown and specified.
- C. All motors for use with equipment with variable frequency drives shall be inverter ready motors. Verify compatibility and sizing of motor with variable frequency drive.
- D. Size motors for 1.15 service factor and not to exceed 40° C temperature rise above ambient.
- E. Fractional horsepower motors to have self-resetting thermal overload switch.
- F. Provide Premium Efficiency, motors for all three phase motors one horsepower and larger. Standard efficiency motors will not be acceptable.

PART 3. EXECUTION

3.1 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, and Electrical Drawings. Coordinate work under this section with that of all related trades.

3.2 INSTALLATION

- A. All work shall comply with the latest adopted applicable codes and ordinances including, but not limited to, the IMC, UPC, IBC, 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.

3.3 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, 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.

3.4 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.

3.5 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.

3.6 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.

3.7 PAINTING

- A. Perform all of the following painting in accordance with provisions of Division 09 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.

3.8 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. Provide Seismic Restraint in Accordance with Specification Section 23 05 48.
- 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. Coordinate with general contractor for location and finish. For additional details, see Architectural, Structural, and Electrical Drawings. Coordinate work under this section with that of all related trades.

END OF SECTION

SELECTIVE DEMOLITION FOR HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

PART 1. GENERAL

1.1 NOTIFICATION

- 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 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

3.1 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.

3.2 DEMOLITION, REMOVAL AND DISPOSITION

- A. Saw-cut concrete as shown or required.
- B. Piping, Ductwork, And Equipment To Be Removed: Remove all piping, ductwork, and equipment as indicated on the Drawings.
- 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.

SELECTIVE DEMOLITION FOR HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

Division 23
Section 23 05 05

- 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. Re-use Of Materials: Only were indicated on Drawings.
- F. Materials To Contractor: Materials shown or specified to be removed, other than the materials indicated to be turned over to Owner.
- G. 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.
- H. 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.
- I. 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

EXPANSION FITTINGS AND LOOPS FOR HVAC PIPING

PART 1. GENERAL

1.1 NOTIFICATION

- 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. Flexible Pipe Connectors.

1.3 RELATED SECTIONS

- A. Section 23 05 00 - Common Work Results for HVAC.
- B. Section 23 05 48 - Vibration and Seismic Controls for HVAC.
- C. Section 23 21 13 - Hydronic Piping.

1.4 REFERENCES

- A. AMSE B31.1 - Power Piping.
- B. ASME B31.9 - Building Services Piping
- C. ASME Section IX - Boiler and Pressure Vessel Code - Welding and Brazing Qualifications.
- D. AWS D1.1 - Structural Welding Code - Steel.

1.5 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Product Data:
 - 1. Flexible Pipe Connectors: Indicate maximum temperature and pressure rating, face-to-face length, live length, hose wall thickness, hose convolutions per foot and per assembly, fundamental frequency of assembly, braid structure, and total number of wires in braid.
- C. Manufacturer's Installation Instructions: Indicate special procedures, and external controls.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.6 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Division 1.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Division 1.

1.8 QUALITY ASSURANCE

- A. Perform Work in accordance with ASME B31.1, ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.

1.9 QUALIFICATIONS

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

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Division 1.
- B. Protect equipment from exposure by leaving factory coverings, pipe end protection, and packaging in place until installation.

1.11 WARRANTY

- A. Provide five year warranty under provisions of Division 1.

PART 2. PRODUCTS

2.1 FLEXIBLE PIPE CONNECTORS

- A. Steel Piping:
 - 1. Manufacturers:
 - a. Mercer Rubber Co., Model BSS.
 - b. Hyspan, series 4500.
 - 2. Inner Hose: Stainless Steel.
 - 3. Exterior Sleeve: Single braided stainless steel.
 - 4. Pressure Rating: 125 psig WSP and 450° F, 200 psig WOG and 250° F psig at 70° F.
 - 5. Joint: As specified for pipe joints.
 - 6. Size: Use pipe sized units.
 - 7. Maximum offset: $\frac{3}{4}$ inch on each side of installed center line.
- B. Copper Piping:
 - 1. Manufacturers:
 - a. Mercer Rubber Co., Model BBF.
 - b. Hyspan, series 4500.
 - 2. Inner Hose: Bronze
 - 3. Exterior Sleeve: Braided bronze.
 - 4. Pressure Rating: 125 psig WSP and 450° F, 200 psig WOG and 250° F and 70° F.
 - 5. Joint: As specified for pipe joints.

6. Size: Use pipe sized units
7. Maximum offset: $\frac{3}{4}$ inch on each side of installed center line.

PART 3. EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Construct spool pieces to exact size of flexible connection for future insertion.
- C. Install flexible pipe connectors on pipes connected to equipment supported by vibration isolation. Provide line size flexible connectors.
- D. Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor other end. Install in horizontal plane unless indicated otherwise.
- E. Rigidly anchor pipe to building structure where necessary. Provide pipe guides so movement is directed along axis of pipe only. Erect piping such that strain and weight is not on cast connections or apparatus.
- F. Provide support and equipment required to control expansion and contraction of piping. Provide loops, pipe offsets, and swing joints, or expansion joints where required.

END OF SECTION

METERS AND GAUGES FOR HVAC PIPING

PART 1. GENERAL

1.1 NOTIFICATION

- 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 SUMMARY

- A. Section Includes:
 - 1. Pressure Gauges.
 - 2. Pressure Gauge Taps.
 - 3. Thermometers.
 - 4. BTU Meters.
- B. PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THE SECTION
 - 1. Section 23 21 13 - Hydronic Piping: Installation of thermometer wells, pressure gauge tappings.

1.3 RELATED WORK

- A. Section 23 05 00 - Common Work Results for HVAC.
- B. Section 23 09 23 - Direct Digital Control System for HVAC.
- C. Section 23 09 93 - Sequence of Operations for HVAC Controls.
- D. Section 23 21 16 - Hydronic Piping Specialties.
- E. Section 23 33 00 - Air Duct Accessories.

1.4 REFERENCE STANDARDS

- A. ASTM E1 - Specification for ASTM Thermometers.
- B. ASTM E77 - Verification and Calibration of Liquid-in-Glass Thermometers.
- C. ASTM E1 - Standard Specification for ASTM Thermometers.

1.5 SUBMITTALS

- A. Product Data: Submit engineering data for each component, include list which indicates use, operating range, total range and location for manufactured components.

- B. Submit manufacturer's installation instructions under provisions of Division 1.

1.6 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Accurately record actual location of all instrumentation and gauges.
- B. Operation and Maintenance Data.

1.7 WARRANTY

- A. Furnish one year manufacturer warranty for HVAC instrumentation.

PART 2. PRODUCTS

2.1 INSTRUMENTATION FOR HVAC

- A. Manufacturers:
 1. Dwyer
 2. Terice.
 3. Weiss.
 4. Marshalltown.
 5. Ashcroft.
 6. Enerpac.
 7. Peterson.
 8. Winters.
 9. Substitutions: In accordance with Division 1.

2.2 PRESSURE GAUGES

- A. 4½" diameter dial size with a flangeless cast aluminum case, stainless steel friction ring and glass window. Movement will be brass with a bronze bourdon tube and brass socket. Dial face will be white with black figures; pointer will be friction adjustable type. Accuracy will be ±1% of scale range, ASME B40.1 Grade 1A. Model 600C as manufactured by Terice.

2.3 PRESSURE GAUGE TAPS

- A. Gauge Isolation Valve: Lever handle ball valve, forged brass body, chrome plated brass ball, viton o-rings for maximum 150 psig. Model Mini T-82-M as manufactured by Jomar or equal.
- B. Needle Valve: Brass for maximum 150 psig. Model 735 as manufactured by Terice or equal.
- C. Pulsation Damper: Pressure snubber, brass with 1/4 inch connections. Series 870 as manufactured by Terice.
- D. Coil Siphon: Brass, ¼", male pipe thread each end. 885 series.

2.4 STEM TYPE THERMOMETERS

- A. Analog Thermometers: 9 inch scale, universal adjustable angle, organic spirits, lens front tube, cast aluminum case with blue/black metallic finish and clear Lexan window, extended brass stem, cast aluminum adjustable joint with positive locking device, 2 percent of scale

accuracy to ASTM E77, scale calibrated in both degrees F and degrees C, range per schedule. BX9 series as manufactured by Trerice or approved equal.

2.5 BTU METERS

- A. Manufacturers:
 - 1. Onicon.
 - 2. Substitutions: Under provisions of Division 1.
- B. Unit mounted microprocessor based calculator, unit mounted or remote mounted LCD display. Native BACnet compatible. Matched RTD temperature sensors, pre calibrated for accuracy of less than +/-0.25 deg F. Ultrasonic flow meter with accuracy of less than +/- 1% over the standard operating range.
- C. Pre-calibrated and certified to N.I.S.T. standards.

PART 3. EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide two pressure gauges per pump, installing taps before strainers and on suction and discharge of pump. Pipe to gauge with isolation valve to each tapping.
- C. Thermometers for measuring fluid temperatures shall have stems with insertion lengths of roughly half of the pipe diameter; minimum insertion length will be 2". Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2 inch for installation of thermometer sockets. Select bulb length to reach centerline of pipe. Thermometers installed on tanks will have a minimum insertion length of 5".
- D. Where insulation thickness exceeds 2", provide a longer stem thermometer with an extension neck, stainless steel separable thermowell. The extension neck shall be at least 2" long.
- E. Coat thermometer stem with heat transfer paste prior to installing into the thermowell.
- F. Install thermometer sockets and flanges adjacent to controls system thermostat, transmitter, or sensors.
- G. Provide instruments with scale ranges selected according to service with largest appropriate scale and range selected so that the operating temperature or pressure of the material being measured will fall approximately in the middle of the scale.
- H. Install gauges BTU meters and thermometers in locations where they are easily read from normal operating level.
- I. Thermometers for measuring air temperatures shall have a perforated guard stem and a mounting flange.

3.2 PRESSURE GAUGE SCHEDULE

LOCATION	SCALE RANGE
Pumps less than 40' TDH	0 - 30 PSIG
Pumps more than 40' TDH	0 - 60 PSIG
Heating system	0 - 30 PSIG
Others	As applicable

3.3 THERMOMETER SCHEDULE

LOCATION	SCALE RANGE
Heating system	0 - 200° F
Others	As applicable

END OF SECTION

HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1. GENERAL

1.1 NOTIFICATION

- 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 WORK INCLUDED

- A. Pipe, Duct, and Equipment Hangers, Supports, and Associated Anchors.
- B. Hanger Rods.
- C. Inserts.
- D. Equipment Curbs.
- E. Equipment Bases and Supports.
- F. Formed Steel Channel.
- G. Sleeves and Seals.

1.3 PRODUCTS FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

- A. Furnish hanger and support sleeves for placement into formwork.
- B. Placement of equipment roof support curbs.

1.4 RELATED WORK

- A. Division 3 - Cast in Place Concrete: Equipment Bases.
- B. Division 7 - Fire Stopping: Joint Seals for Piping and Duct Penetration of Fire Rated Assemblies.
- C. Division 9 - Painting.
- D. Section 23 05 00 - Common Work Results for HVAC.
- E. Section 23 05 48 - Vibration and Seismic Controls for HVAC.
- F. Section 23 07 00 - HVAC Insulation.

- G. Section 23 31 16 - Hydronic Piping.

1.5 REFERENCES

- A. ASME B31.1 - Power Piping.
- B. ASME B31.2 - Fuel Gas Piping.
- C. ASME B31.9 - Building Services Piping.
- D. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
- E. ASTM E119 - Method for Fire Tests of Building Construction and Materials.
- F. ASTM A 194 - Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure and/or High Temperature Service.
- G. ASTM A 307 - Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
- H. ASTM A 575 - Steel Bars, Carbon, Merchant Quality, M-Grades.
- I. ASTM A 653 - Steel Sheet, Zinc-Coated (Galvanized).
- J. ASTM A 675 - Steel Bars, Carbon, Hot-Wrought, Special Quality.
- K. ASTM E814 - Test Method of Fire Tests of Through Penetration Firestops.
- L. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.
- M. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.
- N. ANSI/MSS SP58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
- O. ANSI/MSS SP69 - Pipe Hangers and Supports - Selection and Application.
- P. AWS D1.1 - Structural Welding Code - Steel.
- Q. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
- R. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.
- S. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
- T. UL 1479 - Fire Tests of Penetration Firestops.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable code for support of [hydronic] [steam and steam condensate] piping.

1.7 SUBMITTALS

- A. Submit under provisions of Division 1.

- B. Product Data: Provide manufacturers catalog data including load capacity.
- C. Manufacturer's Installation Instructions: Indicate special procedures and assembly of components.

1.8 QUALITY ASSURANCE

- A. Perform Work in accordance with AWS D1.1 for welding hanger and support attachments to building structure.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Delivery, storage and handle products under provisions of the Supplementary Conditions.
- B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
- C. Protect from weather and construction traffic, dirt, water, chemical, and damage, by storing in original packaging.

PART 2. PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS

- A. Acceptable Manufacturers:
 - 1. Anvil.
 - 2. Eaton.
 - 3. Erico.
 - 4. Holdrite.
 - 5. PHD Manufacturing, Inc.
- B. Hydronic Piping:
 - 1. Conform to ANSI/MSS SP58.
 - 2. Hangers for Pipe Sizes ½ to 1-½ Inch: Malleable iron, adjustable swivel, split ring for steel pipe, copper swivel for copper pipe.
 - 3. Hangers for Hot Pipe Sizes 2 to 4 Inches and Cold Pipe Sizes 2 Inches and Larger: Carbon steel, adjustable, clevis.
 - 4. Hangers for Hot Pipe Sizes 6 Inches and Over: Adjustable steel yoke, cast iron roll, double hanger.
 - 5. Multiple or Trapeze Hangers: Steel channels or strut with hanger rods. Cast iron roll and stand for hot pipe sizes 6 inches and over.
 - 6. Wall Support for Pipe Sizes to 3 Inches: Strut triangular bracket with pipe clamp and cushion insulator.
 - 7. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp; adjustable steel yoke and cast iron roll for hot pipe sizes 6 inches and over.
 - 8. Vertical Support: Steel riser clamp.
 - 9. Floor Support for Pipe Sizes to 4 Inches and All Cold Pipe Sizes: Cast iron adjustable pipe saddle, locknut nipple, floor flange or steel support.
 - 10. Floor Support for Hot Pipe Sizes 6 Inches and Over: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.
 - 11. Copper Pipe Support: Carbon steel ring, adjustable, copper plated with felt isolation pad or all copper ring or swivel.

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- 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.
- F. Design hangers to allow installation without disengagement of supported pipe.
- G. Copper Plating: All hanger elements in metal-to-metal contact with copper pipe shall have copper plating, hanger rings with factory-applied 1/16 inch minimum thick plastic, or tape cushion strip over all contact surfaces.
- H. Strut Type Pipe Hanging System: Unistrut P-1000 series; framing members shall be No. 12 gage formed steel channels, 1-5/8 inch square, conforming to ASTM A653 GR33, one side of channel shall have a continuous slot with inturred lips; framing nut with grooves and spring 1/2 inch size, conforming to ASTM 675 GR60; screws conforming to ASTM A 307; fittings conforming to ASTM A 575; all parts enamel painted or electro-galvanized.

2.2 HANGER RODS

- A. Steel Hanger Rods: Mild steel, threaded both ends, threaded one end, or continuous threaded.

2.3 ANCHOR BOLTS

- A. Anchor (Expansion) Bolts: Shall be carbon steel to ASTM A 307; nut shall conform to ASTM A194; shall be drilled-in type. Design values for shear and tension shall be not more than 80 percent of the allowable load.

2.4 INSERTS

- A. Inserts: Malleable iron case of [galvanized] steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.5 FLASHING

- A. Metal Flashing: 26 gauge minimum galvanized steel.
- B. Metal Counter Flashing: 22 gauge minimum galvanized steel.
- C. Lead Flashing: 5 lb./sq. ft. sheet lead for waterproofing; one lb./sq. ft. sheet lead for soundproofing.
- D. Flexible Flashing: 47 mil thick sheet butyl; compatible with roofing.
- E. Caps: Steel, 22 gauge minimum; 16 gauge at fire resistant elements.

2.6 EQUIPMENT CURBS

- A. Fabricate curbs of concrete or steel beam, unless specifically called out otherwise.

2.7 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Floors: Form with 18 gauge galvanized steel for 4 inch diameter and larger, 22 gauge up to 3" diameter.
- B. 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.
- C. Sleeves for Pipes Through Fire Rated and Fire Resistive Floors and Walls, and Fireproofing: Prefabricated fire rated sleeves including seals, UL listed caulking system.
- D. Fire Stopping Insulation: Mineral fiber type, non- combustible.
- E. Caulk: Fire stop sealant in compliance with ASTM E814, UL 1479 and Division 7.
- F. 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.

2.8 FORMED STEEL CHANNEL

- A. Manufacturers:
 - 1. Atkore Allied Tube & Conduit Corp.
 - 2. Eaton B-Line Series.
 - 3. PHD Manufacturing, Inc.
 - 4. Substitutions under provisions of Division 1.
- B. Product Description: Galvanized 12 gauge (2.8 mm) thick steel. With holes 1-1/2 inches (38 mm) on center.

PART 3. EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install pipe hangers in accordance with ANSI/MSS-SP-69.

3.2 PIPE HANGERS AND SUPPORTS

- A. Support piping as follows:

Pipe Size	Max. Hanger Spacing	Hanger Diameter
½ to 1-¼ inch	6'-0"	3/8"
1-½ to 2 inch	10'-0"	3/8"
2-½ to 3 inch	10'-0"	½"
4 to 6 inch	10'-0"	5/8"
8 to 12 inch	14'-0"	7/8"

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- B. Install hangers to provide minimum ½ inch space between finished covering and adjacent work.
- C. Place a hanger within 12 inches of each horizontal elbow.
- D. Use hangers with 1-½ inch minimum vertical adjustment.
- E. Support vertical piping at every floor.
- F. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- G. Support riser piping independently of connected horizontal piping.
- H. Design hangers for pipe movement without disengagement of supported pipe.
- I. Provide copper plated hangers and supports for copper piping.
- J. Prime coat exposed steel hangers and supports. Refer to Division 9. Hangers and supports located in crawlspace, pipe shafts, and suspended ceiling spaces are not considered exposed.
- K. Provide transverse seismic support for all piping systems.

3.3 INSERTS

- A. Provide inserts for placement in concrete formwork.
- B. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
- D. Where concrete slabs form finished ceiling, provide inserts to be flush with slab surface.
- E. Where inserts are omitted, drill through concrete slab from below and provide thru-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

3.4 EQUIPMENT BASES AND SUPPORTS

- A. Provide equipment bases of were shown on plans and where required by equipment manufacturer installation instructions.
- B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct support of steel members. Brace and fasten with flanges bolted to structure.
- D. Provide housekeeping pads of concrete, Refer to Division 3.
- E. Provide rigid anchors for pipes after vibration isolation components are installed.
- F. Anchor (Expansion) Bolts: Install anchor bolts for all mechanical equipment, piping and ductwork as required. Tightly fit and clamp base-supported equipment anchor bolts at all equipment support points. Provide locknuts where equipment, piping, and ductwork is hung.

Install anchor (expansion) bolts in holes drilled in concrete where necessary to hang piping or ductwork, or to anchor stationary equipment from existing concrete slabs.

3.5 FLASHING

- A. Provide flexible flashing and metal counter-flashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Provide curbs for mechanical roof installations 16 inches minimum high above roofing surface. Flexible sheet flash and counter-flash with sheet metal; seal watertight.
- C. 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.
- D. Provide acoustical flashing around ducts and pipes penetrating equipment rooms, installed in accordance with manufacturer's instructions for sound control.

3.6 SLEEVES

- A. Set sleeves in position in construction. Provide reinforcing around sleeves.
- B. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- C. Extend sleeves through floors one inch above finished floor level. Pack and 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 area or occupancy separation 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.

3.7 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.

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END OF SECTION

VIBRATION AND SEISMIC CONTROLS FOR HVAC

PART 1. GENERAL

1.1 NOTIFICATION

- 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 WORK INCLUDED

- A. This section provides minimum acceptance requirements for vibration isolation and seismic/wind restraints for all HVAC piping, ductwork equipment and piping.

1.3 GENERAL

- A. The requirements for seismic protection measures to be applied to plumbing equipment and systems specified herein are in addition to any other items called for in other sections of these specifications.

1.4 HVAC PIPING, DUCTWORK AND EQUIPMENT

- A. This section provides minimum acceptance requirements for vibration isolation and seismic/wind restraints for all HVAC equipment, piping and ductwork. HVAC equipment shall include all items on mechanical plans or in other sections of the Division 23 specifications. Equipment shall include but not be limited to:
 1. Boilers
 2. Air Separators.
 3. Expansion tanks
 4. Glycol Tanks.
 5. Pumps.
 6. Hydronic Piping.
 7. Fuel Oil Piping.
 8. Natural Gas Piping.
 9. Ductwork.
 10. Duct Silencers.

1.5 RELATED WORK SPECIFIED ELSEWHERE

- A. Concrete work is provided in Division 3.
- B. Seismic restraints for fire suppression systems are provided in Division 21.
- C. Vibration isolation and seismic/wind restraints for plumbing systems are specified elsewhere in Division 22.

- D. Vibration isolation and seismic restraints for electrical systems are provided in Division 26.

1.6 QUALITY ASSURANCE

- A. The following codes and standards will apply:
 - 1. International Building Code.
 - 2. American Society of Civil Engineers (ASCE) 7-16.
- B. Manufacturer's Qualifications: Firms regularly engaged in manufacture of vibration control and wind restraint products of type, size, and capacity required, whose products have been in satisfactory use in similar service for not less than 5 years.
- C. The following guides may be used for supplemental information on typical seismic installation practices:
 - 1. Federal Emergency Management Agency (FEMA) manuals 412, Installing Seismic Restraints for Mechanical Equipment and 414, Installing Seismic Restraints for Ductwork and Pipe.
 - 2. Sheet Metal and Air-conditioning Contractors' National Association's (SMACNA) Seismic Restraint Manual Guidelines for Mechanical Systems.
 - 3. American Society for Heating, Refrigerating and Air-conditioning Engineers' (ASHRAE) A Practical Guide to Seismic Restraint.
 - 4. Manufacturers Standardization Society of the Valve and Fittings Industry MSS SP-127-2014a, Bracing for Piping Systems, Seismic - Wind - Dynamic, Design, Selection, Application.

1.7 COMPONENT IMPORTANCE FACTOR

- A. In order to identify systems requiring seismic restraint and to define those from which restraints may be excluded, utility components are assigned an ASCE 7 Importance Factor (I_p) on the basis of the following:
 - $I_p = 1.5$ Natural gas piping and fuel oil piping.
 - $I_p = 1.0$ All other components.

1.8 SUBMITTALS

- A. Submit shop drawings and manufacturer's data in accordance with Division 1.
- B. Provide calculations for selection of seismic/wind restraints in accordance with IBC and ASCE 7, certified by a qualified professional engineer, licensed in the state of the project.
- C. Submit adequate number of City Plan Review department set of shop drawings and seismic calculations for their review. Submit to City plan review and owner concurrently. Submit plan review approved set to Engineer when available. The submittals must include a licensed engineer's stamp and signature and shall be provided as deferred submittal.
- D. Provide Shop drawings along with catalog cuts, templates and erection and installation details, as appropriate, for the items listed. Submittals shall be complete in detail; shall indicate thickness, type, grade, class of metal; and dimensions; and shall show construction details, reinforcement, anchorage, and installation with relation to the building construction.

PART 2. PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Vibration isolators and Seismic Restraint shall be manufactured by:
 1. Amber/Booth.
 2. Cooper Industries.
 3. International Seismic Application Technology.
 4. Kinetics Noise Control.
 5. Mason Industries.
 6. Vibro-Acoustics.
 7. Substitutions: Items of same function and performance are acceptable in conformance with Division 1.

2.2 SEISMIC BRACING AND SUPPORT OF SYSTEMS AND COMPONENTS

- A. General:
 1. Seismic restraint designer shall coordinate all attachments with the structural engineer of record.
 2. Design analysis shall include calculated dead loads, static seismic loads, and capacity of materials utilized for the connection of the equipment or system to the structure.
 3. Analysis shall detail anchoring methods, bolt diameter, and embedment depth.
 4. All seismic restraint devices shall be designed to accept without failure the forces calculated per the applicable building code and as summarized in installation requirements.
 5. The total height of the structure (h) and the height of the system to be restrained within the structure (z) shall be determined in coordination with architectural plans and the General Contractor.
- B. Friction from gravity loads shall not be considered resistance to seismic forces.

2.3 SEISMIC BRACING COMPONENTS

- A. Steel strut shall be 1-5/8 wide in varying heights and mig-welded combinations as required to meet load capacities and designs indicated. A material heat code, part number, and manufacturer's name shall be stamped on all strut and fittings to maintain traceability to material test reports.
 1. Material for epoxy painted strut: ASTM A1011, SS, Grade 33.
 2. Material for pre-galvanized strut: ASTM A653, SS, Gr. 33.
 3. Material for Hot-Dip Galvanized strut: ASTM A1011, SS, Grade 33 and hot-dip galvanized after fabrication in accordance with ASTM A123.
 4. Material for fittings and accessories: ASTM A907 Gr. 33, Structural Quality or ASTM A1011, SS, Gr.33.
 5. Fittings and accessories: Products shall be of the same manufacturer as strut and designed for use with that product.

2.4 SEISMIC BRACING AND RESTRAINT

- A. Provide positive attachment for seismic and wind restraints on those systems and components required by the applicable building code and by the local authority having jurisdiction.
- B. Provide restraint devices as required, specified, and as scheduled for isolated and non-isolated systems and equipment. Provide calculations to determine restraint loadings for all restrained systems and equipment resulting from seismic forces.

- C. Springs: All springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. All springs except internal nested springs shall have an outside diameter not less than 0.8 of the compressed height of the spring. Ends of springs shall be square and ground for stability. Laterally stable springs shall have k_x/k_y ratios of at least 0.9. All springs shall be fully color-coded to indicate capacity - color striping is not considered adequate.
- D. Corrosion Protection: All springs shall be powder-coated enamel. Housings shall be hot dipped galvanized, powder-coated enamel, or painted with rust-resistant paint.
- E. Seismic/Wind Spring Floor Mounts: Laterally stable, restrained spring type with support for bolting to the equipment. Springs shall be supported either with a neoprene cup or a metal base plate complete with a neoprene noise isolation pad, minimum 1/4" (6 mm) thick, bonded to the base plate. Mount shall include integral all-directional limit stops with elastomeric grommets preventing metal-to-metal contact and with minimum 1/4" clearance under normal operation.
- F. Seismic/Wind Restrained Spring Isolator: Laterally stable, restrained spring type with housings and heavy top plates for supporting the equipment and resisting seismic and wind loading. Housings shall be of welded steel construction and include vertically restraining limit stops. Maximum clearance around the restraining bolts shall be 1/4" (6 mm). Top plate and restraining bolts shall be out of contact with the housing during normal operation and neoprene grommets shall be incorporated to minimize short-circuiting of restraining bolts. Housing must be hot-dip galvanized for outdoor applications. For indoor applications, powder-coated finish is acceptable for the housing.
- G. Seismically Rated Rubber-in-Shear Floor Mounts "Double-deflection" neoprene isolators, with mounting bracket and all-directional snubber for seismic restraint. Snubber shall include elastomeric components to prevent metal-to-metal contact under normal operation and during a seismic event. Datasheets shall include load/deflection curves based on manufacturer testing; test reports shall be available on request. Neoprene Element shall be color-coded to identify load capacity.
- H. Seismic Cable Restraints: Preassembled Adjustable Seismic cable sway bracing restraints shall consist of 7x19 galvanized steel aircraft cable sized to resist seismic loads. Cable restraint system shall be completely preassembled to eliminate onsite assembly of restraint components and must allow quick and easy adjustment on the length of the cable after the installation to remove excessive sag on the cable. Cable end connections shall use heavy brackets, thimbles, and wire rope clips or compression sleeves.
- I. Rigid Restraints: Seismic rigid sway bracing restraints shall include heavy duty brackets made of high-strength, low alloy steel designed to provide enough strength to withstand seismic load. To prevent any confusion, brackets should be universal to be used for both structure and equipment attachments and should accommodate post-installation of seismic restraints without the requirement of disassembling the hanger rod or any component of the equipment. No drilling should be required to secure rigid restraint brackets to the rigid brace, and rigid restraint system must include special grade hardware for attachments. Rigid restraint brackets must be color-coded for capacity identification.
- J. Hanger Rod Stiffener: Structural steel angle attached with a formed steel clamp (Type VAC) to threaded rod support. Steel angle to be provided by contractor; steel clamp to be provided by seismic restraint manufacturer.
- K. Seismic Inline Pump Stands: Trapezoidal-shaped rigid support stands made of high strength, low alloy steel designed to connect to pipe flanges which support vertical inline pumps. Stands shall include neoprene grommet washers for anchor bolts and be designed to provide

adequate restraint for connected equipment to resist seismic loads. Provide vibration isolation pads under pump stands as shown on the schedule or details.

- L. Seismic Pipe Stand: (Adjustable Height) - rigid support pipe stands made of high-strength steel rigid restraints, low alloy designed to support the dead load, and provide enough strength to withstand at least 1 g of lateral seismic force. In addition to providing allowance for roof slopes, the adjustable height stands shall be used to accommodate changing pipe sizes.
- M. Seismic Restraint Brackets: Formed steel brackets for securing floor-mounted equipment complete with pre-drilled holes. Brackets shall be galvanized or powder coated enamel for corrosion protection.
- N. Seismic Snubber: Structural steel angle(s) with surfaces covered with ribbed neoprene pads to cushion contact with snubber. Customized snubber designs may use other structural shapes and configurations as required. Snubbers shall be designed to limit equipment motion to no more than 6 mm (1/4") in any direction.
- O. Concrete Anchors: Post-installed anchors in concrete shall be qualified for seismic/wind restraint application.
 - 1. Mechanical anchor bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. (In accordance with ACI 355.2 and ICC-ES AC193)
 - 2. Adhesive Anchor Bolts: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. (In accordance with ACI 355.4 and ICC-ES AC308)

PART 3. EXECUTION

3.1 GENERAL

- A. Coordinate size, doweling, and reinforcing of concrete equipment housekeeping pads and piers with vibration isolation and seismic restraint device manufacturer to ensure adequate space and prevent edge breakout failures. Pads and piers must be adequately doweled in to structural slab.
- B. Coordinate locations and sizes of structural supports with locations of vibration isolators and seismic/wind restraints (e.g., roof curbs, cooling towers, air-cooled chillers, etc.).
- C. Isolated and restrained equipment and piping located on roofs must be attached to the structure. Intermediate supports between the restraint and structure that are not attached to the structure must be approved by the restraint manufacturer.

3.2 SEISMIC/WIND RESTRAINTS

- A. General:
 - 1. All equipment and piping shall be restrained to resist seismic/wind forces per the applicable building code(s) as a minimum. Restraint attachments shall be made by bolts, welds or a positive fastening method. Friction shall not be considered. All attachments shall be proven capable of accepting the required wind load by

calculations. Additional requirements specified herein are included specifically for this project.

2. Install seismic and wind restraint devices per the manufacturer's submittals. Any deviation from the manufacturer's instructions shall be reviewed and approved by the manufacturer.
3. Attachment to structure for suspended equipment and pipe: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
4. Wall penetrations may be used as bracing locations provided the wall can provide adequate resistance without significant damage.
5. Coordinate sizes and locations of cast-in-place inserts for post-tensioned slabs with seismic restraint manufacturer.
6. Provide hanger rod stiffeners where indicated or as required to prevent buckling of rods due to seismic forces.
7. Where rigid restraints are used on equipment or piping, support rods for the equipment or piping at restraint locations must be supported by anchors rated for seismic use. Post-installed concrete anchors must be in accordance with ACI 355.2.
8. Ensure housekeeping pads have adequate space to mount equipment and seismic restraint devices and shall also be large enough to ensure adequate edge distance for restraint anchor bolts to avoid housekeeping pad breakout failure.

B. Concrete Anchor Bolts:

1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid pre- or post-tensioned tendons, electrical and telecommunications conduit, and gas lines.
2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Mechanical Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
5. Set anchors to manufacturer's recommended torque, using a torque wrench.

C. Equipment Restraints:

1. Seismically restrain equipment as indicated on the schedule. Install fasteners, straps and brackets as required to secure the equipment.
2. As indicated on the schedule, install seismic snubbers on HVAC equipment supported by floor-mounted, non-seismic vibration isolators. Locate snubbers as close as possible to vibration isolators and attach to equipment base and supporting structure as required.
3. Install neoprene grommet washers on equipment anchor bolts where clearance between anchor and equipment support hole exceeds 1/8" (3.2 mm).
4. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

D. Duct Systems:

1. Seismically restrain all ductwork listed below, using seismic cable restraints:
 - a. All ducts with cross-sectional area equal to or greater than 6 ft² (0.55 m²).

- b. Any ductwork which if it were to fail would result in damage to a piece of equipment or building function that has a component importance factor of 1.5.
 - c. All ductwork weighing more than 17 lbs/ft (25 kg/m).
 2. "12-inch rule", where duct can be exempted from seismic restraint based on the length of the support rods, is accepted if one of the following conditions are met:
 - a. The hangers shall be detailed to avoid significant bending of the hangers and their attachments. The maximum stress due to combined loading including bending in the hangers must be less than 21.6 ksi.
 - b. Isolation hangers are added to hanger rod to provide swivel joint and to prevent bending moment in hanger.
 3. Space lateral supports a maximum of 30' o.c. (9 m), and longitudinal supports a maximum of 60' (18 m) o.c.
 4. Duct risers shall be restrained at floor penetrations every 30' (9 m) maximum spacing.
 5. Fire damper locations may be used as restraint locations for all directions except away from the damper.
 6. Brace a change of direction longer than 12' (3.7 m).
 7. Install restraint cables so they do not bend across edges of adjacent equipment or building structure.
- E. Piping Systems:
 1. For projects with a Seismic Design Category of D provide seismic cable restraints on the following:
 - a. All piping greater than 3" (75 mm) nominal diameter.
 - b. All piping systems assigned a component importance factor, I_p , of 1.5 with a nominal pipe diameter greater than 1" (25 mm) or trapeze-supported piping with combined operating weight over 10 lbs/ft (15 kg/m).
 2. "12-inch rule", where pipe can be exempted from seismic restraint based on the length of the support rods, is accepted if one of the following conditions are met:
 - a. Hangers are detailed to avoid bending of the hangers and their attachment; and provisions are made for piping to accommodate expected deflections. The maximum stress due to combined loading including bending in the hangers must be less than 21.6 ksi.
 - b. Isolation hangers are added to hanger rod to provide swivel joint and to prevent bending moment in hanger.
 3. Restraint spacing:
 - a. For ductile piping, space lateral supports a maximum of 40' (12 m) o.c., and longitudinal supports a maximum of 80' (24 m) o.c.
 - b. For non-ductile piping (e.g., cast iron, PVC) space lateral supports a maximum of 20' (6 m) o.c., and longitudinal supports a maximum of 40' (12 m) o.c.
 - c. For piping with hazardous material inside (e.g., natural gas, medical gas) space lateral supports a maximum of 20' (6 m) o.c., and longitudinal supports a maximum of 40' (12 m) o.c.
 - d. For pipe risers, restrain the piping at floor penetrations using the same spacing requirements as above.
 4. Brace a change of direction longer than 12' (3.7 m).
 5. Longitudinal restraints for single pipe supports shall be attached directly to the pipe, not to the pipe hanger.
 6. For supports with multiple pipes (trapezes), secure pipes to trapeze member with clamps approved for application.
 7. Piping on roller supports shall include a second roller support located on top of the pipe at each restraint location to provide vertical restraint.
 8. Install restraint cables so they do not bend across edges of adjacent equipment or building structure.
 9. Install flexible metal hose loops in piping which crosses building seismic joints, sized for the anticipated amount of movement.

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10. Install flexible piping connectors where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one supporting the connections as they approach equipment.
11. Coordinate seismic restraints with thermal expansion compensators, guides and anchor points. Thermal expansion anchor points shall be designed to accommodate seismic forces.

END OF SECTION

IDENTIFICATION FOR HVAC PIPING, DUCTWORK AND EQUIPMENT

PART 1. GENERAL

1.1 NOTIFICATION

- 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 RELATED DOCUMENTS

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

1.3 SUMMARY

- A. Section Includes identification of HVAC piping, ductwork and equipment installed under Division 23.
- B. Related Sections:
 - 1. Division 9 - Painting and Coating: Execution requirements for painting specified by this section.

1.4 REFERENCES

- A. ANSI/ASME A13.1 - Scheme for the Identification of Piping Systems.

1.5 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Include product data on: Nameplates, tags, stencil and paint, and pipe markers.

1.6 QUALITY ASSURANCE

- A. Conform to ANSI/ASME A13.1 for color scheme for identification of piping systems and accessories.

PART 2. PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Seton.
- B. Marking Services Inc.

- C. Craftmark Identification Systems.
- D. Substitutions: Under provisions of Division 1.

2.2 MATERIALS

- A. Color: Unless specified otherwise, conform with ANSI/ASME A13.1.
- B. Plastic Nameplates: Laminated three-layer plastic with engraved black or white letters on contrasting background color. Plate size minimum $\frac{3}{4}$ " X 2- $\frac{1}{2}$ ".
- C. Plastic Tags: Laminated three-layer plastic with engraved black or white letters on contrasting background color. Tag size minimum 1- $\frac{1}{2}$ inch square.
- D. Metal Tags: Brass with stamped letters; tag size minimum 1- $\frac{1}{2}$ inch diameter with smooth edges.
- E. Stencils: With clean cut symbols and letters of following size:

Outside Diameter of Insulation or Pipe	Length of Color Field	Size of Letters
$\frac{3}{4}$ " - 1- $\frac{1}{4}$ "	8"	$\frac{1}{2}$ "
1- $\frac{1}{2}$ " - 2"	8"	$\frac{3}{4}$ "
2- $\frac{1}{2}$ " - 6"	12"	1- $\frac{1}{4}$ "
8" - 10"	24"	2- $\frac{1}{2}$ "
Over 10"	32"	3- $\frac{1}{2}$ "
Ductwork and Equipment	-----	2- $\frac{1}{2}$ "

- F. Stencil Paint: Semi-gloss enamel, colors and lettering size conforming to ANSI/ASME A13.1.
- G. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and fluid being conveyed. Larger sizes may have maximum sheet size with spring fastener.
- H. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.
- I. Valve Chart Frame: Aluminum frame with plastic windows.

PART 3. EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.
- B. Prepare surfaces in accordance with Division 9 for stencil painting.

3.2 INSTALLATION

- A. Apply stencil painting in accordance with Division 9.
- B. Install identifying devices after completion of coverings and painting.
- C. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.
- D. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer. For unfinished canvas covering, apply paint primer before applying labels.
- E. Install tags using corrosion resistant chain. Number tags consecutively by location.
- F. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.
- G. Equipment: Identify air handling units, pumps, heat transfer equipment, tanks, and water treatment devices with plastic nameplates. Small devices, such as in-line pumps, may be identified with plastic or metal tags.
- H. Identify control panels and major control components outside panels with plastic nameplates.
- I. Identify valves in main and branch piping with tags showing service and valve number.
- J. Identify piping, concealed or exposed, with plastic pipe markers or stenciled painting. Tags may be used on small diameter piping. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.
- K. Ductwork: Identify ductwork with plastic nameplates or stencil. Identify as to air handling unit number, and area served. Locate identification at air handling unit, at each side of penetration of structure or enclosure, and at each obstruction.
- L. Provide ceiling tacks to locate valves above T-bar type panel ceilings. Locate in corner of panel closest to equipment.
- M. Locations: Nameplates shall be located so as to be readily visible to maintenance personnel. Motor nameplates shall be readily visible on accessible, three phase motors, otherwise a duplicate motor nameplate shall be permanently affixed to the driven machinery in a visible locations.

3.3 VALVE CHART AND SCHEDULE

- A. Provide valve chart and schedule at location as directed. Chart shall show valve number, service and normal position. Provide a reduced scale copy of drawings showing valves and valve number. Provide copies of valve chart and drawings for inclusion in operation and maintenance manuals in accordance with Section 23 05 00.

END OF SECTION

TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1. GENERAL

1.1 NOTIFICATION

- 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 WORK INCLUDED

- A. Air Systems:
 - 1. Constant Volume Air Systems.
 - 2. Existing HVAC Systems.
- B. Hydronic Systems:
 - 1. Variable Flow Systems.

1.3 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 liquid heat transfer systems.
 - 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.

1.4 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

1.5 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.

1.6 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

1.7 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.

1.8 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.

1.9 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

2.1 INSTRUMENTS

- A. Maintain all instruments accurately calibrated and in good working order. Use instruments with the following minimum performance characteristics.
 - 1. Air Velocity Instruments: Direct reading in feet per minute, 2% accuracy.
 - 2. Static Pressure Instruments: Direct reading in inches' water gauge, 2% accuracy.
 - 3. RPM Instruments: Direct reading in revolutions per minute, .5% accuracy; or revolution counter accurate within 2 counts per 1,000.
 - 4. Pressure Readout: Direct reading in feet of water or PSI, .5% accuracy.
 - 5. Temperature Instruments - Direct reading in degrees F, +.5% accuracy.
 - 6. Water Flow Instruments: Differential pressure type; direct reading in feet of water or PSI, accuracy, suitable for readout balancing valve provided.
 - 7. Sound Measuring Instrument: Octave Band Analyzer which essentially complies to AASA Standards SI.6 1960 with a range of 24DB to 150 DB sound pressure level ref. .0002 microbar. Calibrate sound test instrument before use to a closed coupler and a driving loudspeaker that produces a know-sound pressure level at the microphone of the analyzer.

PART 3. EXECUTION

3.1 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.

3.2 BALANCING LOW VELOCITY CONSTANT VOLUME DUCTWORK

- A. Analyze system and identify major branches. Tabulate design CFM for each branch.
- B. Select the branch which appears to be the longest run from the fan or to have the highest static pressure requirements.

- C. Adjust other branch dampers or the fan to establish 110% design air flow through the selected branch.
- D. Adjust the air flow through each air inlet (exhaust systems) or outlet (supply systems) on the selected branch to within +5% of the requirements so that at least one branch damper serving an inlet (or outlet) is wide open.
- E. Proceed to another branch and set up 110% design airflow. Balance each inlet or outlet to within +5% of requirements, again leaving at least one wide open run. Repeat this process until all branches are balanced 110% airflow.
- F. Once each branch has been balanced at 110% flow with one wide open run on each branch, balance with branches together, leaving at least one branch damper wide open. At this point, adjust the fan delivery so that each branch is at about 110% design airflow. Adjust the branch dampers so that each inlet (or outlet) in the system is within 10% of the required airflow.
- G. Adjust the fan for design airflow.
- H. Read and record the airflow at each inlet and outlet.
- I. Secure each branch damper and mark the balanced position of the damper quadrant.
- J. Test and record entering and leaving air temperatures of coils.
- K. Test and record entering and leaving water temperatures of coils.
- L. Test and record static pressure drop across each filter and coil bank.

3.3 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.
 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

1.1 NOTIFICATION

- 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. Piping Insulation.
- B. Equipment Insulation.
- C. Ductwork Insulation.
- D. Jackets and Accessories.

1.3 RELATED WORK

- A. Division 9 - Painting.
- B. Section 23 05 00 - Common Work Results for HVAC Systems.
- C. Section 23 05 16 - Expansion Fittings and Loops for HVAC Piping.
- D. Section 23 05 19 - Meters and Gages for HVAC Piping.
- E. Section 23 21 13 - Hydronic Piping.
- F. Section 23 21 16 - Hydronic Specialties.
- G. Section 23 31 00 - HVAC Ducts and Casings.
- H. Section 23 33 00 - Air Duct Accessories.

1.4 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. UL 723 - Surface Burning Characteristics of Building Materials.

1.5 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.

1.6 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.
- D. Factory fabricated fitting covers manufactured in accordance with ASTM C450.

1.7 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.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesive, mastics, and insulation cements.

1.9 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

2.1 ACCEPTABLE MANUFACTURERS

- A. Armacell.
- B. Certain-Teed.
- C. IMCOA.
- D. Johns Manville.
- E. Knauf.

- F. Owens-Corning.
- G. Manson.
- H. Pittsburgh - Corning.
- I. K-Flex USA.
- J. Armstrong.
- K. Substitutions: Under provisions of Division 1.

2.2 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.

2.3 FIELD APPLIED PIPING 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.

2.4 INSULATION - EQUIPMENT

- A. Type G: Rigid fiberglass board with FSK outer facing. Johns Manville 814 FSK, 3.0 lbs./cu. ft. density, ASTM C612, K= .23 @ 75° F, 450° F maximum service temperature, Johns Manville 1000 series "Spin-Glas" or approved equal.
- B. Type H: Reusable Thermal Insulation Covers, HVAC Equipment: 2" thermal insulating wool, 2.4 lb./cu.ft. density, maximum temperature rating of 1000 Deg. F; Interior/Exterior Fabric: 17 oz./sq. yd. silicone coated fiberglass cloth, maximum temperature range of -80 to 500 Deg F; Securement: Lacing Anchors, fourteen gauge stainless steel with 1.5" diameter stainless steel speed washers; Sewing Thread: Kevlar/Stainless Steel S-110 Natural with stainless steel core, all blanket seems to be single sewn lock stitch interior seams, six to nine stitches per inch; Drawcord: 0.125" diameter #4 ultra-strength polyester. Thermal Energy Products "Energy-Wrap EW.2T.NM.SH.SC" or approved equal.
- C. Type I: Reusable Valve Wrap Insulation Covers: Removable and reusable wraps packaged with a 1" thick fiberglass blanket insert to completely cover the insulated equipment. The outer cover of the shall be made of DuPont Tychem® QC that is secured with a Velcro

closure. Tychem® QC consists of a durable Tyvek® substrate quality coated with polyethylene that is impermeable to water. K= .28 @ 100° F; Temperature Limits 0°F to 450°F; Water Vapor Transmission ASTM E 96 0.01 Perms at 37.8C/100F-RH/100%; Breaking Strength Grab (md/cd) ASTM D5034-90 43/49 lbs; Tearing Strength Trapezoid (md/cd) ASTM D1117-80 7/5 lbs; Weatherable Grade; UV resistant; White/gloss finish; UL25/50 rating and are non-combustible per ASTM E 136. NOSWEAT Reusable Valve Wraps or approved equal.

2.5 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.

2.6 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.

2.7 INSULATION ACCESSORIES

- A. Adhesives: Waterproof and fire-retardant type.
- B. Lagging Adhesive: Fire resistive to ASTM E84 and UL 723.
- 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-2000 Calsil" or equal.

PART 3. EXECUTION

3.1 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.

3.2 INSTALLATION – PIPING INSULATION

- 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 insert fabricated of Johns Manville Thermo-12 Gold or other heavy density insulating material suitable for temperature between support shield and piping on piping 1-½" inch diameter or larger. Insulation inserts shall not be less than the following lengths:

1-½" to 2-½" 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.

3.3 SCHEDULE – PIPING

PIPING	TYPE	PIPE SIZE	MINIMUM INSULATION THICKNESS
Heating Glycol/Water Supply and Return	A, E	1-1/4" and Smaller	1-1/2"
Heating Glycol/Water Supply and Return	A, E	1-1/2" and Larger	2"

3.4 INSTALLATION - EQUIPMENT

- A. Install materials in accordance with manufacturer's instructions.
- B. Do not insulate factory insulated equipment.
- C. Apply insulation as close as possible to equipment by grooving, scoring, and beveling insulation, if necessary. Secure insulation to equipment with studs, pins, clips, adhesive, wires, or bands. Minimum 2" overlap on blanket material.
- D. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor barrier cement.
- E. Cover insulation with metal mesh and finish with heavy coat of insulating cement.
- F. Do not insulate over nameplate or ASME stamps. Bevel and seal insulation around such.
- G. When equipment with insulation requires periodical opening for maintenance, repair, or cleaning, install insulation in such a manner that it can be easily removed and replaced without damage.
- H. Where canvas jacketing is indicated, apply mastic in sufficient thickness to completely cover the texture of the canvas material.

3.5 SCHEDULE - EQUIPMENT

EQUIPMENT	INSULATION TYPE	THICKNESS
Air Separator	G, H	2"
Valves 2" and larger	I	2"

3.6 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. Duct Exterior Insulation (Type K,L) 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. Where canvas jacketing is indicated, apply mastic in sufficient thickness to completely cover the texture of the canvas material.

3.7 SCHEDULE - DUCTWORK

DUCTWORK	TYPE	INSULATION THICKNESS	FINISH
Combustion Air Duct	L	2" Rigid	CANVAS

END OF SECTION

DIRECT DIGITAL CONTROL FOR HVAC

PART 1. GENERAL

1.1 NOTIFICATION

- 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 RELATED SECTIONS

- A. Section 23 05 00 - Common Work Results For HVAC.
- B. Section 23 05 93 - Testing, Adjusting and Balancing for HVAC.
- C. Section 23 09 93 – Sequence of Operation
- D. Section 23 21 13 - Hydronic Piping.
- E. Section 23 21 16 - Hydronic Specialties.
- F. Division 26 - Electrical Specifications.

1.3 GENERAL REQUIREMENTS

- A. This section specifies the requirements for the Building Automation System (BAS) to be installed in conjunction with this project.
- B. The BAS contractor shall furnish and install a fully integrated building automation system, incorporating direct digital control (DDC) for energy management, equipment monitoring and control, and subsystems as specified herein.
- C. The BAS contractor shall be responsible for all BAS and temperature control wiring for a complete and operable system. All wiring shall be done in accordance with Division 26 of this specification and all local and national codes.
- D. A new PC client workstation is not required. The existing Siemens DESIGO server at Facilities Maintenance shall be updated at the completion of this project to reflect any additions and changes made during this project.
- E. All graphics, programming and host databases shall be updated to reflect any changes or additions made under this contract. Programming shall follow the latest revision of the established building automation system standards of the Anchorage School District.

- F. The BAS system shall be capable of remote monitoring via the owner's existing Ethernet network. A dedicated dual-port Ethernet connection at each DDC controller will be provided by the electrical contractor where and activated by the owner's IT department or as indicated on the electrical drawings.
- G. The internal components of the legacy BAS control panels (i.e. SCU, MBC or MEC-type panels) shall be upgraded to the latest version of the Siemens PXC-Modular or PXC-Compact digital control panel. Existing panel enclosures, raceways and wiring may be reused wherever practical.
- H. Verify that any existing or new Fire Alarm and Security system monitoring points are connected to the BAS and are functional.
- I. Verify that the existing sequences of operation are functional at the completion of these upgrades.
- J. Verify that the existing utility metering (Domestic Water, Natural Gas and Electric usage) is functional.

1.4 WORK BY OTHERS

- A. Products furnished by the BAS contractor for installation by the Mechanical contractor:
 - 1. Control valves.
 - 2. Wells for hydronic temperature sensors.
- B. Products provided and installed by Mechanical contractor:
 - 1. Gauges, thermometers, instrumentation and thread-o-lets for sensor wells.
 - 2. Control dampers.
- C. The Electrical contractor (Division 26) provides:
 - 1. Mounting and power wiring of variable frequency drives (VFDs) furnished by the BAS contractor.
 - 2. Wiring of all power feeds through disconnects and starters to electrical motors.
 - 3. Wiring of any remote start/stop switches and manual or automatic motor speed control devices not furnished by the BAS contractor
 - 4. Duct smoke detectors including installation and wiring.
 - 5. Power wiring.
 - 6. Ethernet data port as required at each of the designated BAS control panels.

1.5 SUBMITTALS / O&M MANUALS

- A. All submittals will be bound in white D-ring binders with sufficient ring capacity available for future additions. Electronic submittals are acceptable if directed by the owner.
- B. Progression from Submittal to O&M Manual can take place using the same binders as long as all applicable material is properly updated.
- C. Prior to beginning on-site installation, the BAS contractor will submit four (4) complete sets of documentation containing the following:
 - 1. Sequence of Operations (Designer to provide electronic text version)
 - 2. Riser Diagrams
 - 3. Control Diagrams
 - 4. Panel layout(s)
 - 5. Valve Schedule

6. Point Summary Report
 7. Product Data
- D. The O&M Manuals will consist of the following:
1. Sequence of Operations
 2. Riser Diagrams
 3. Control Diagrams
 4. Panel layouts
 5. Valve Schedule
 6. Point Summary Report
 7. Commented Program Code
 8. Trend Logs
 9. Product Data

1.6 INSTALLATION SCHEDULING AND COORDINATION

- A. If this is an existing facility, it may require interface with the existing system. Provide appropriate interface with the existing system as required. Maintain operation of the existing DDC system during construction as required.
- B. Wherever possible, remove any existing controls-related wiring, pneumatic tubing and electrical conduit that is not reused as part of the new building automation system.

PART 2. PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Acceptable manufacturers are limited to the following in accordance with ASD standards:
1. Siemens Industry, Inc. 5333 Fairbanks St., Ste. B, Anchorage, AK 99518. Contact Siemens at (907) 563-2242 for specific questions.
 2. No substitutions, No alternate brands accepted.

2.2 NETWORKING COMMUNICATIONS

- A. The design of the BAS shall network the stand-alone DDC Controllers. The network architecture shall consist of three levels; a campus-wide Management Level Network (MLN) Ethernet network based on TCP/IP protocol, a high performance peer-to-peer building level network (BLN) and DDC Controller floor level local area networks (FLN). Access to the system shall be totally transparent to the user when accessing data or developing control programs.
- B. The design of the BAS shall allow the co-existence of both new and existing DDC Controllers on the same network without the use of gateways, protocol converters, or third-party interface devices.
- C. Management Level Network (MLN)
1. The Management Level Network shall not impose a maximum constraint on the number of operator workstations.
 2. Simultaneous user access to the network shall be limited to number of user licenses currently issued to ASD.
 3. DDC controllers residing on the peer-to-peer building level network shall connect directly to the Ethernet network.

4. Any PC on the Ethernet Management Level Network shall have transparent communication with controllers on the building level networks connected via Ethernet as well as directly connected building level networks. Any PC shall be able to interrogate any controller on the building level network in addition to being able to download program changes to individual controllers.
 5. The Management Level Network shall reside on industry standard Ethernet utilizing standard TCP/IP, IEEE 802.3. The Ethernet system will be provided and maintained by UAF.
 6. Access to the system database shall be available from any client workstation on the Management Level Network.
- D. Peer-to-Peer Building Level Network (BLN)
1. Data transfer on the Building Level Network (BLN) shall be via Ethernet on all new DDC panel installations.
- E. Floor Level Network (FLN)
1. The Floor Level Network (FLN) communication shall support a family of application specific controllers and shall communicate with the peer-to-peer network through DDC Controllers for transmission of global data.

2.3 PERSONAL COMPUTER OPERATOR WORKSTATION

- A. A new personal computer workstation is not required. The existing workstation shall be reused and updated at the completion of this project to reflect any additions and changes made during this project. If the existing workstation hardware requires replacement or removal, it will be performed by the ASD IT department.

2.4 HVAC CONTROLLERS

- A. New digital HVAC controllers shall be the PXC-Modular or PXC-Compact series manufactured by Siemens. Controllers shall be a 12-bit stand-alone, multi-tasking, multi-user, real-time digital control processors consisting of modular hardware with plug-in enclosed processors.
- B. Each HVAC Controller shall have sufficient memory to support its own operating system and databases, including:
1. Control processes
 2. Energy management applications
 3. Alarm management applications including custom alarm messages for each level alarm for each point in the system.
 4. Historical/trend data for points specified
 5. Maintenance support applications
 6. Custom processes
 7. Operator I/O
 8. Remote communications
- C. HVAC Controllers shall provide a RS-232C serial data communication port for operation of operator I/O devices such as industry standard printers, operator terminals, modems and portable laptop operator's terminals
- D. HVAC Equipment Controllers shall provide local LED status indication for each digital input and output for constant, up-to-date verification of all point conditions without the need for an operator I/O device.

- E. Each HVAC Equipment Controller shall continuously perform self-diagnostics, communication diagnosis and diagnosis of all components. The HVAC Equipment Controller shall provide both local and remote annunciation of any detected component failures, low battery conditions or repeated failure to establish communication
- F. All controllers will be mounted in enclosed control panels with screwed, removable covers.
- G. All control devices located in exposed areas subject to outside weather conditions shall be mounted inside weatherproof enclosures. Location of each panel shall be convenient for adjustment service.
- H. Nameplates shall be provided beneath each panel face mounted control device describing the function of each device. Nameplates shall have white letters engraved on black Lamidicoid plates that identify the panel name and number.
- I. All control panels shall bear a UL label compatible with the application.
- J. All electrical devices within the panel shall pre-wired to terminal strips with all inter-device wiring within the panel completed prior to installation of the system.

2.5 AUTOMATIC CONTROL VALVES

- A. All automatic control valves shall be fully proportioning with modulating plugs for equal percentage or linear flow characteristics. The valves shall be sized by the BAS contractor and be provided with actuators of sufficient power for the duty intended. Valve body and actuator selection shall be sufficient to handle system pressure and shall close against the differential pressures expected to be encountered on the project.
- B. Valves - 1/2 in. through 1 in. diameter: Valves shall be constructed with cast iron, brass or stainless bodies. Trim shall consist of a removable cage providing valve plug guiding throughout the entire travel range. A stainless steel stem shall be provided. Bonnet, cage and the stem and plug assembly shall be removable for servicing. Actuator shall be cast aluminum with spring-return piston operated by synthetic rubber diaphragm. Body rating shall be 400-PSI at 150 degrees F.
- C. Valves - 1-1/2 in. through 2 in. diameter: Valves shall be constructed with cast iron, brass or stainless bodies. For special duty, valves may be selected by the BAS contractor to have either bronze or cast iron bodies with screwed or flanged ends. Valves shall have either piston or diaphragm actuators as required.
- D. Valves - 2-1/2 in. diameter and above: Valves shall be constructed with cast iron, brass or stainless bodies and have flanged connections. Use full port motorized ball valves for boiler isolation service.
- E. Heating valves shall fail normally open, cooling valves normally closed. Terminal unit control valves may fail at last position to maintain occupant comfort.

2.6 TEMPERATURE SENSORS

- A. All electronic temperature sensors shall be standard resistance type for all temperature ranges. All electronic temperature sensors shall be factory calibrated and of tamper proof construction requiring no field calibration. Temperature sensor accuracy shall be a minimum of +/- 1%. To ensure system accuracy, a common sensor shall be used for each control loop to provide control, indication (local and central), alarm indication (local and central) and

where multi-control functions, such as discharge temperature control with compensation and positive high and low limits are used.

- B. Where the sensor is used for sensing of mixed air temperature or air handler coil discharge temperatures, and/or the duct area cross-section is in excess of 14 square feet, the instrument shall incorporate an averaging element. Outside air sensing shall be accomplished using a sensing element and transmitter shielded from the effects of sunlight.
- C. Sensors shall be furnished in scale ranges compatible with system operating range.
- D. Where sensors are used for sensing liquid temperatures, they shall be furnished with separable wells or appropriate material.
- E. Electronic Room Temperature Sensors: Shall be thermistor type with 55 degree F to 95 degree F range. Optional features include: LED display, temperature adjustment and night override button. Covers shall be robust, of institutional quality, and suitably finished. Provide sensing-only, stainless-steel flush-mount covers where indicated on the drawings or as required to meet ASD standards.

2.7 THERMOSTATS

- A. Line-voltage Thermostats: Shall have bi-metal switches with a rating of at least 1.2 times the load they are handling. Covers will be sensing only.
- B. Provide locking covers in foyers, hallways and public areas, or were indicated on mechanical drawings.

2.8 HIGH AND LOW LIMIT THERMOSTATS

- A. Low limit thermostats shall employ a 20-foot element. If any one-foot section of the element is subjected to temperatures below 35 degrees F (adjustable), the respective electric or pneumatic circuit shall open causing action to fans and dampers as required under the sequence of operation.
- B. High limit thermostats shall employ rod and tube type elements that extend approximately ten inches into the duct. If instrument is subjected to temperatures above 135 degrees F, action required by sequence of operations shall occur. Where high limit is required for fire protection, such thermostats shall be UL listed for fire protection.
- C. Shall be manual reset or automatic reset with time delay. Manual resets will have alarmable contacts.

2.9 PRESSURE GAUGES AND THERMOMETERS

- A. To be provided and installed by the mechanical contractor as specified elsewhere.

2.10 INTERPOSING RELAYS AND SIGNAL TRANSMITTERS

- A. All necessary interposing relays and signal transmitters shall be furnished to make the system a full and operable system as required by the Sequence of Operations.

2.11 AIR AND WATER FLOW PROOF DEVICES

- A. Provide current-sensing relays as standard proof devices for all fan and pump motors. Pressure differential switches and paddle type flow switches are not acceptable.
 - 1. Provide solid-state, adjustable, current operated relay. Provide a relay that changes switch contact state in response to an adjustable set point value of current in the monitored A/C circuit.
 - 2. Adjust the relay switch point so that the relay responds to motor operation under load as an ON state and so that the relay responds to an unloaded running motor as an OFF state. A motor with a broken belt is considered an unloaded motor.
- B. Provide status device for any fans, motors and pumps as reference in the Points List or Sequence of Operations.

2.12 LIQUID PRESSURE TRANSMITTERS

- A. Provide integral pressure transducer and transmitter in enclosure suitable for exposed mechanical room or panel mounting. 4-20ma output proportional to the input pressure span. Internal components shall be selected appropriate for the sensed medium taking temperature, pressure, corrosive properties and medium consistency into account. Transmitter range shall be selected so that the normal operating setpoint is midway between the upper and lower range of the transmitter. Transmitter shall be rated for a minimum of 125% of maximum expected system operating pressures.
- B. For differential pressure sensing applications, provide transmitter unit with 3-valve manifold to allow unit to be serviced without draining system. Each transmitter shall have field adjustable span and zero adjustments for field calibration.
- C. Accuracy $\pm 1.0\%$ of full scale. Linearity $\pm 0.1\%$. Ashcroft, Robinson-Halpern, Johnson-Yokogawa, Rosemount or equal.

2.13 DAMPER ACTUATORS

- A. Electric control shall be Siemens Building Technologies *OpenAir*™ direct-coupled actuators. Damper actuators shall be brushless DC Motor Technology with stall protection, bi-directional, fail safe spring return, all metal housing, manual override, independently adjustable dual auxiliary switch. Actuators shall be designed for mounting directly to the damper shaft without the need for connecting linkages.
- B. Provide actuators in sufficient size, quantity and type to match application. Provide a minimum of one damper actuator for each 30 square feet of damper area.
- C. Damper actuators shall be spring return as indicated by Normally Closed or Normally Open designation on drawings or in sequence of operation. VAV damper actuators shall fail to last position.

2.14 UTILITY MONITORING

- A. Verify operation of any existing utility meters (Natural Gas, Domestic Water and Electricity). Provide new meters if required.
 - 1. Natural Gas: The natural gas meter is currently monitored by the BAS. Verify proper operation at the completion of this project.
 - 2. Domestic Water: The domestic water usage is currently monitored by the BAS. Verify proper operation at the completion of this project.

3. Electricity: Monitor electrical usage and quality at the main distribution panel through the BAS. If no meter currently exists, provide a new digital energy monitor (DEM) at the main distribution panel. Siemens MD-P1-3-CTSC or equal. Select the DEM to meet the amperage and size requirements of the main distribution panel.

2.15 VARIABLE FREQUENCY DRIVES

- A. Scope: Furnish Variable Speed Drives as specified on the drawings and schedules. Standard and optional features shall be included within the VFD enclosure as specified.
- B. General: The VFD shall convert three-phase, 60 Hz utility power to adjustable voltage and frequency, three-phase, AC power for stepless motor speed control from 10% to 100% of the motor's 60 Hz speed. Input voltage shall be as specified on the drawing schedule. The VFD shall include a converter and an inverter section. The converter section shall convert fixed frequency and voltage AC utility power to variable DC voltage. VFD's that use silicon controlled rectifiers in the converter bridge shall also include an input power isolation transformer. The isolation transformer shall be housed in a separate NEMA 1 enclosure and shall include a copper electrostatic shield. The VFD shall utilize IGBT, PWM or 6-step waveform technology. The VFD maximum output current rating shall be 110% of the motor nameplate full load current. The VFD and options shall be listed by a nationally recognized testing agency such as UL or ETL. The VFD and options shall comply with the applicable requirements of the latest standards of ANSI, IEEE, and the National Electric Code. Power line noise shall be limited to a voltage distortion factor and line notch depth as defined in IEEE Standard 519-1981, Guide for Harmonic Control and Reactive Compensation of Static Power Converters. The VFD shall not emit either conducted or radiated RFI in excess of the limitations set forth in the FCC Rules and Regulations, Part 15, Subpart J.
- C. Construction: The VFD shall include the following basic features:
 1. The VFD shall be housed in a NEMA 1 enclosure.
 2. The following operator controls shall be located on the front of the enclosure:
 - a. Run/stop selector switch to start and stop the motor
 - b. Auto/manual selector switch
 - c. Manual speed potentiometer
 - d. Power on pilot light to indicate that the VFD is being supplied by the power line.
 - e. Fault pilot light to indicate that the VFD has tripped on a fault condition
 - f. Digital meter with selector switch to indicate percent speed and percent load.
 - g. Volt meter and amp meter.
 - h. Two sets of Form C, dry contacts to indicate when the VFD is in the run mode.
 - i. Two sets of Form C, dry contacts to indicate when the VFD is in the fault mode.
 - j. When input power returns to normal following a fault trip for undervoltage, overvoltage, or phase loss, the VFD shall automatically restart. The VFD shall not automatically restart following fault trips due to overload or overcurrent.
 - k. Factory minimum-level spare fuse kit.
 - l. Relay for RED signal from motor.
 - m. Input circuit breaker.
- D. Protective Requirements: The VFD shall include the following protective features:
 1. Current limiting semiconductor fused for the power input.
 2. Separate overload relay for each motor controlled.
 3. Protection against input power undervoltage, overvoltage and phase loss.
 4. Protection against output current overload and overcurrent.

5. Protection against overtemperature within the VFD.
 6. Protection against overvoltage on the DC bus.
 7. Any disconnect switches between VFD and the motor shall include an auxiliary contact interlocked to the VFD fault trip circuit.
 8. DC bus discharge circuit for protection of service personnel.
- E. Adjustments: The VFD shall include the following adjustments available via potentiometers inside the enclosure:
1. Maximum speed, adjustable 50-100% base speed.
 2. Minimum speed, adjustable 0-50% base speed.
 3. Acceleration time, adjustable 2-60 seconds.
 4. Deceleration time, adjustable 2-60 seconds with override circuit to prevent nuisance trips if deceleration time is set too short.
 5. Current limit, adjustable 1-110%.
- F. Special Requirements: The following special features shall be included in the VFD enclosure.
1. Manual bypass shall provide all the circuitry necessary to transfer the motor from the VFD to the power line, or from the line to the controller while the motor is at zero speed. The bypass circuitry shall be mounted in a separate section of the VFD enclosure. Two motor contactors, electrically interlocked, shall be utilized. One contactor is to be between the controller and the motor. The other contactor is to be between the bypass power one and the motor providing across-the-line starting. Motor protection is to be provided in both the controller mode and the bypass mode. The bypass section door shall include a "drive/line" switch, "on/off-reset" and a "load transferred to line" pilot line. The bypass circuitry shall include a fused disconnect switch or circuit breaker to provide a means of disconnecting all power to both the bypass circuitry and the controller. The disconnect switch or circuit breaker shall be door interlocked and lockable. The fused or circuit breaker shall be sized to provide short circuit protection for the motor when in the bypass mode per NEC.
- G. Start-up Service: The manufacturer shall provide start-up service in the form of a factory trained service technician. The service technician shall verify correct installation, start-up the drive and check for proper operation
- H. VFD Warranty: The VFD shall be warranted by the manufacturer for a period of 24 months from the date of shipment. The warranty shall include parts, labor, travel costs, and living expenses incurred by the manufacturer to provide factory-authorized service
- I. Approved Manufacturer(s): Square D S-Flex enclosed AC drives for consistency. No substitutions allowed.

PART 3. EXECUTION

3.1 RELATED DOCUMENTS

- A. Refer to General Conditions, Basic Materials and Methods and Division 26.

3.2 GENERAL

- A. Do not install control devices in locations where they are subject to damage or malfunction due to normally encountered ambient temperatures.

- B. Mount damper operators and other control devices secured to insulated ductwork on brackets such that the device is external of the insulation.

3.3 IDENTIFICATION

- A. All controllers, switches, relays, thermostats and actuators shall be permanently tagged for identification.
- B. The tagging scheme shall be reflected on the control drawings.
- C. Submit proposed identification method, specifically listing each device and the identification tag to be applied.

3.4 INSTALLATION AND WIRING

- A. Install, connect and wire the items included under this Section. This work includes providing required conduit, wire, fittings, and related wiring accessories. All wiring in exposed or inaccessible areas shall be installed in EMT conduit. Plenum-rated cable may be used in concealed, accessible areas only, such as plenums above suspended ceilings or raised floors.
- B. Provide wiring between thermostats and unit heater motors, and all control and alarm wiring.
- C. Provide conduit and wiring between the BAS panels and the temperature, humidity, or pressure sensing elements, including low voltage control wiring in conduit or plenum-rated cable.
- D. Provide conduit and control wiring for devices specified in this Section.
- E. Plenum-rated cabling is acceptable in concealed, accessible spaces. All exposed control wiring and all wiring in mechanical rooms shall be enclosed in EMT conduit.
- F. Provide conduit and signal wiring between motor starters in motor control centers and high and/or low temperature relay contacts and remote relays in BAS panels located in the vicinity of motor control centers.
- G. Provide conduit and wiring between the sensors, metering, instrumentation, indicating devices, miscellaneous alarm points, remotely operated contactors, and BAS panels, as shown on the drawings or as specified.
- H. All wiring to be compliant with the Division 26 requirements and the NEC.
- I. Provide electrical wall boxes and conduit sleeves for all wall-mounted devices. Mount thermostats at 48 inches AFF unless otherwise noted.

3.5 WARRANTY

- A. Upon completion of the project, as defined in the Contract Conditions, a warranty period of one (1) year shall commence. The warranty shall consist of a commitment by the BAS contractor to provide, at no cost to the Owner, parts and labor as required to repair or replace such parts of the control system that prove inoperative due to defective materials or installation practices. The warranty expressly excludes routine service such as instrument calibration.

3.6 TREND LOGS

- A. BAS contractor shall prepare trend logs for all points required to show system calibration and stability.
- B. These logs shall document building operation after the installation, balancing and calibration is completed and after the control system is fully operational. Setpoints, valve positions, etc. shall be adjusted to artificially induce the sequences to occur.

3.7 COMMISSIONING AND SYSTEM DEMONSTRATION

- A. The BAS contractor shall demonstrate proper operation of all systems per the Sequence of Operations.
- B. The demonstration shall include, but not necessarily be limited to, the following:
 - 1. Review of the Trend Logs.
 - 2. Complete and proper operation of control systems including simulations.
 - 3. Access to all devices for required maintenance.
 - 4. Review of associated graphics on the operator workstation.

3.8 TRAINING

- A. Eight (8) hours of on-site instruction will be provided by the BAS contractor to familiarize operating personnel with the control system. instructions will include:
 - 1. A brief description of the controls' sequence of operation.
 - 2. A discussion and explanation of all alarms, switches and gauges.
 - 3. A summary and explanation of steps to be taken in response to specific alarms or control malfunctions.
 - 4. Building walk-through to physically locate and examine all control devices and demonstrate control setpoint adjustment procedures.
 - 5. Instructions regarding adjustment procedures shall emphasize methods for continual building "fine-tuning".

3.9 SEQUENCE OF OPERATION

- A. Reference: Section 23 09 93 – Sequence of Operation. If no sequence of operation is provided, then provide sequences that meet the latest published version of the ASD Building Automation System standards maintained by ASD and Siemens.

END OF SECTION

SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

PART 1. GENERAL

1.1 NOTIFICATION

- 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. Boilers.
- B. Domestic Water Heaters.
- C. Domestic HW Circulating Pumps.
- D. Fuel Oil Day Tank.
- E. Existing Mechanical Room Ventilation Fan.
- F. Fintube Radiation.
- G. Existing Equipment.

1.3 RELATED SECTIONS

- A. Section 23 05 00 - Common Work Results for HVAC.
- B. Section 23 09 23 - Direct Digital Control System for HVAC.
- C. Section 23 21 23 - Hydronic Pumps.

1.4 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.

1.5 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.

1.6 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

3.1 BOILERS (B-1, B-2, B-3)

- A. Alarms:
 - 1. B-1, 2, 3 Failure.
 - 2. Main hydronic loop low HWS temperature
 - 3. Low system pressure.
 - 4. Boiler Emergency Shutdown Switch
- B. Digital Control and Indication:
 - 1. B-1,2,3 On-Off Control.
 - 2. B-1,2,3 On-Off Status.
 - 3. B-1,2,3 Modulating Firing Rate Control.
 - 4. B-1,2,3 Natural gas or fuel oil mode indication.
 - 5. Main hydronic loop HWR temperature indication.
 - 6. Main hydronic loop HWS temperature indication.
 - 7. B-1,2,3 HWS temperature indication.
 - 8. Main hydronic loop HWS temperature setpoint.
 - 9. Outdoor air temperature indication.
 - 10. Outdoor temperature reset adjustment.
 - 11. Boiler System Enable/Disable Mode.
 - 12. Boiler lead/lag alternator setting.
 - 13. Boiler Group Lead/lag alternator setting.
 - 14. B-1 through 3 totalized burner run time.
 - 15. System Pressure Indication
 - 16. Alarm setpoints.
- C. Automated Control:
 - 1. Provide DDC programming to alternate boilers lead/lag, enable/disable boiler on low fire, modulate between high/low fire and operate associated isolation valves. The DDC System shall operate to maintain boiler supply set point based on outside air reset schedule as defined below. Programming shall incorporate rate of rise calculation to prevent boiler operation when system temperature is not decreasing. Programming shall include minimum run times for boilers, minimum time delay between cycling boilers on/off and minimum run time for boiler circulation pumps after boiler has completed firing. Adjust minimum timing as required to optimize boiler performance and in accordance with boiler manufacturer's recommendations.

SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

Division 23
Section 23 09 93

2. Boiler B-1,2,3 Fuel Oil Operation: Manually turn boiler to the off position, manually turn dial from gas to fuel oil and manually turn boiler back on. DDC system shall monitor switch position. When fuel oil mode is enabled minimum boiler supply temperature shall be 150 Degrees F.
3. Outside Air Reset: The DDC system shall set the boiler supply temperature setpoint based on an adjustable outside air temperature reset schedule. The intent is to operate the boiler system at the lowest temperature possible to maximize boiler efficiency. Initial settings as follows:

Outside Temperature	Loop HWS Temperature
0° F	180° F
60° F (Natural Gas Operation)	150° F
60° F (Fuel Oil Operation)	150° F

4. Domestic Hot Water Priority: If building domestic hot water system is unable to maintain setpoint, increase HWS setpoint to 180° F. When domestic hot water system achieves setpoint, the supply temperature shall return to standard scheduled outside air temperature reset schedule.
5. Supply Temperature reset override: If building low temperature is sensed to be below minimum temperature of 55 Deg F (Initial setting, adjustable), then the Hot Water Supply temperature setpoint shall increase to 180 Deg F (Initial Setting, adjustable). When building low temperature rises above 65 Deg F (Initial setting, adjustable), then supply temperature shall return to standard scheduled outside air temperature reset schedule.
6. Low Supply Temperature Alarm: Use enhanced alarming for the boiler header supply temperature sensor alarming based on the following settings:
 - a. Day Mode: +/- 15 degrees off the boiler control setpoint
 - b. Night Mode: +100 or -60 off of a fixed setpoint of 100 degrees
 - c. Mode: Based on boiler common enable.
 - d. Level Delay: 15 minutes
 - e. Mode Delay: 15 minutes
7. Building Common Low Temperature Monitoring: If any room temperature drops below 55 degrees F or any boiler header, hot water supply or hot water return temperature drops below 100 degrees F, and the outside air temperature is below 50 degrees F, a building common low temperature critical alarm will occur.
8. Outside Air Temperature Shutdown: If Outside air temperature rises above 67 Deg F (Initial setting, adjustable), disable boilers and building heating circulation pumps. When outside air temperature drops below 62 Deg F (Initial setting, adjustable), enable building circulation pumps. After pumps have operated for 5 minutes enable boiler system.
9. During Critical pump failure alarm for CP-1 and 2 the DDC system shall send signal to boiler control panel to disable boilers.
10. Boiler Safety shutdown:
 - a. Verify boiler pump status and emergency off boilers if not present.
 - b. Verify system pump status and disable boilers if not present.
 - c. Provide a boiler status alarm after one hour with no proof and emergency on the boiler (this allows a boiler to be reset by a technician and placed back online without any DDC commands).
 - d. Release priorities on a return to normal.
11. Boiler lead/lag:
 - a. Rotate boiler B-1, 2 and 3 as the lead boiler on a monthly basis. The lag boiler shall be B-1, 2 and 3 under normal operating conditions.
 - b. Release any non-logical lead/lag commands.
 - c. Do not release logical lead/lag logical commands.
12. Boiler staging:

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- a. Turn on lead boiler after the system pumps have run 15 minutes, the header temperature is 3F below setpoint, and the system loop demand is greater than 14%.
 - b. Turn off the lead boiler (when 10F above setpoint or loss of pump proof status.
 - c. Turn on lag boiler when the when the lead boiler firing rate exceeds 95%, the header temperature is 4F below setpoint, the rate of rise is less than 0.5F, and the lead boiler has been on 30 minutes, OR the header is 10F below setpoint (this allows the system to recover after warm weather shutdown)
 - d. Turn off the lag boiler when the header temperature is 2F above setpoint, the lead firing rate is below 50%, OR the header temperature is 6F above setpoint (prevents boiler from tripping high limit and allows the boiler run in simple on/off mode when the load is less than the minimum firing rate).
13. Boiler firing rate control:
- a. Give boilers a common boiler setpoint to control from based on the header temperature/header setpoint loop or a ratcheting reset routine (can be used where a loop maybe unstable).
 - b. Compare the common boiler setpoint (this is different from the header setpoint) to individual boiler temperatures to drive each individual boilers firing rate loop.
 - c. Do not control boilers directly from the system loop as this results in boilers overshooting and hitting the limit due to the header temperature response being slower than the internal boiler temperature response.
 - d. Ramp firing rates to reduce over-cycling boilers during warm weather (boilers should be operated as strictly on/off non-modulating when the minimum firing rate exceeds the building load), 30 minutes at minimum firing and 60 minutes to high fire.
 - e. Ramp firing rates more aggressively in warm weather to allow faster recovery times, 3 minutes at minimum firing and 20 minutes to high fire.
 - f. Start the firing rate ramp at the minimum value required to start the boiler.
 - g. Limit the minimum firing rate to what is required to hold the boilers on.
14. DDC Valve Control Lead Boiler Group:
- a. Lead off = valve open, lag off = valve open.
 - b. Lead on = valve open, lag off = valve closed.
 - c. Lead on = valve open, lag on = valve open or lag status on = valve open.
 - d. Stand-by Boilers = valves closed.
15. Boiler shutdown:
- a. Run pumps 30 minutes after shutdown.
 - b. Turn off and release all alarms.
 - c. Set boilers to a minimum firing rate.
 - d. Monitor boilers for status and if present restart associated pumps (this allows flow through boilers during manual operation).
16. Point Release:
- a. Continually release all timers.
 - b. Release boilers enable and modulation points twice daily.
 - c. Do not release lead/lag unless the value is commanded to a nonsensical number, then release immediately.
17. Miscellaneous Control:
- a. System pump call to run based on boiler system enable.
 - b. Boilers are normally labeled left to right while facing the boilers to minimize confusion.
 - c. Provide a DPDT HOA switch to allow manual operation with modulation.
18. Emergency Boiler Shutdown: Provide resettable red pushbutton for emergency shutdown of boilers. Hardwire interlock pushbutton to disable all boilers when button is pressed. Provide red placard above pushbutton to read "Emergency Boiler Shutdown".

3.2 EXISTING HEATING WATER CIRCULATION PUMPS (CP-1A, 1B)

- A. Alarms:
 - 1. CP-1A and 2B No flow.
 - 2. CP-1A and 2B VFD Fault.
- B. Digital Control and Indication:
 - 1. CP-1A and 1B On-Off Control.
 - 2. CP-1A and 1B On-Off Indication.
 - 3. Lead pump selector.
 - 4. Outside Air Enable/Disable Mode.
 - 5. CP-1A and 2B Speed.
 - 6. Hydronic Heater Water Flow Rate (GPM)
 - 7. Hydronic Heater Water Flow Rate Setpoint
 - 8. Alternator setting.
- C. Automated Control:
 - 1. The lead pump variable frequency drive shall modulate up/down as necessary to maintain flow rate setpoint.
 - 2. The minimum flow rate shall be 240 GPM to provide minimum flow through lead boiler. Increase boiler flow rate to 480 GPM when two or more boilers are enabled. Upon failure of the lead pump, the lag pump shall operate.
 - 3. Alternator: Lead/lag pump operation shall alternate every month of use per ASD Standards.
 - 4. Provide critical alarm if both pumps fail to operate.
 - 5. Outside Air Temperature Shutdown: If Outside air temperature rises above 67 Deg F (Initial setting, adjustable), disable boilers and building heating circulation pumps. When outside air temperature drops below 62 Deg F (Initial setting, adjustable), enable building circulation pumps. After pumps have operated for 5 minutes enable boiler system.

3.3 DOMESTIC WATER HEATING CIRCULATION PUMPS (CP-3A, 3B)

- A. Alarms:
 - 1. CP-3A and 3B No flow.
- B. Digital Control and Indication:
 - 1. CP-3A and 3B On-Off Control.
 - 2. CP-3A and 3B On-Off Indication.
 - 3. Lead pump selector.
 - 4. Alternator setting.
- C. Automated Control:
 - 1. Lead pump shall operate continuously when building is occupied. The pump shall be off when all the following conditions are true:
 - a. When the security is armed.
 - b. It is a weekend, and all rental zones are inactive.
 - c. It is a weekday, and the time is earlier than 6AM.
 - d. It is a weekday, and the time is later than 6PM.
 - 2. Alternator: Lead/lag pump operation shall alternate every month of use per ASD Standards.
 - 3. Provide critical alarm if both pumps fail to operate.

3.4 DOMESTIC WATER HEATERS (WH-1,2, ST-1, STORAGE TANK CIRCULATION PUMP CP-4)

- A. Alarms:
 - 1. Low Supply Temperature.
 - 2. High Supply temperature.
- B. Digital Control and Indication:
 - 1. WH-1 Domestic Hot Water Supply Temperature.
 - 2. WH-2 Domestic Hot Water Supply Temperature.
 - 3. ST-1 Domestic Hot Water Supply Temperature.
 - 4. Water Storage Tank Temperature.
 - 5. Storage Tank Circulation Pump CP-4 On-Off Control.
 - 6. Storage Tank Circulation Pump CP-4 On-Off Indication.
 - 7. Tempered How Water Supply Temperature.
- C. Automated Control:
 - 1. The water heater controls will operate to maintain 140 Deg F Hot Water supply temperature.
 - 2. The water storage tank pump CP-4 shall operate to maintain 140 Deg F Hot Water Storage Tank temperature.
 - 3. Tempering valve shall be initially manually adjusted to supply 120-degree F hot water to the building (adjustable).

3.5 DOMESTIC HW CIRCULATING PUMP (CP-5)

- A. Alarms:
 - 1. No flow.
- B. Digital Control and Indication:
 - 1. Pump On-Off Control.
 - 2. Pump On-Off Indication.
- C. Automated Control:
 - 1. The pump shall operate on/off. The pump shall be on when building is occupied, the pump shall be off when all the following conditions are true:
 - a. When the security is armed.
 - b. It is a weekend, and all rental zones are inactive.
 - c. It is a weekday, and the time is earlier than 6AM.
 - d. It is a weekday, and the time is later than 6PM.

3.6 FUEL OIL DAY TANK (DT-1)

- A. Alarms (Monitor by Dry Contacts on DT Controller):
 - 1. Low Level.
 - 2. High Level.
 - 3. Leak.
 - 4. Not in Auto.
- B. Automated Control:
 - 1. Packaged controls shall operate pumps to maintain tank level.

3.7 GLYCOL MIX TANK (GT-1)

- A. Alarms:

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1. Low Level.
 - B. Digital Control and Indication:
 1. None.
 - C. Automated Control:
 1. System shall normally be off. Utilize supervised fill procedure only. Package controls shall cycle pump on as required to obtain system operating pressure initially set at 12 PSIG, adjustable.
- 3.8 FINTUBE
- A. Alarms:
 1. Room Temperature Alarm.
 - B. Digital Control and Indication:
 1. Space temperature setpoint.
 2. Space temperature indication.
 3. Control Valve position.
 4. Alarm setpoints.
 - C. Automated Control:
 1. Control valve shall cycle open/closed to maintain setpoint.
- 3.9 UTILITIES EQUIPMENT
- A. Gas Meter and Domestic Water Meter: The domestic water usage is currently monitored by the BAS. Verify proper operation at the completion of this project.
- 3.10 EXISTING EQUIPMENT
- A. Automated Control:
 1. Maintain existing sequences of operations for existing equipment.
 2. Test existing systems after panel upgrades to verify sensor, devices and sequences are operational.

END OF SECTION

FACILITY FUEL-OIL PIPING

PART 1. GENERAL

1.1 NOTIFICATION

- 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 WORK INCLUDED

- A. Fuel Oil Piping
- B. Fuel Oil Day Tanks.
- C. Unions and Flanges.
- D. Valves.
- E. Pipe Hangers and Supports.
- F. Relief Valves.
- G. Strainers.
- H. Flexible Connectors.
- I. Fuel Oil Deaerator / Filter.

1.3 RELATED WORK

- A. Section 23 05 00 - Common Work Results for HVAC.
- B. Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC.

1.4 REFERENCES

- A. American Society of Mechanical Engineers:
 - 1. ASME B16.3 - Malleable Iron Threaded Fittings.
 - 2. ASME B31.1 - Power Piping.
 - 3. ASME B31.9 - Building Services Piping.
 - 4. ASME B36.10M - Welded and Seamless Wrought Steel Pipe.
 - 5. ASME Section IX - Boiler and Pressure Vessel Code - Welding and Brazing Qualifications.
- B. ASTM International:

1. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 2. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.
- C. American Welding Society:
1. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.
 2. AWS D1.1 - Structural Welding Code - Steel.
- D. International Mechanical Code - IMC, latest adopted edition.
- E. National Fire Protection Association:
1. NFPA 30 - Flammable and Combustible Liquids Code.
 2. NFPA 31 - Standard for the Installation of Oil-Burning Equipment.
- F. Underwriters Laboratories Inc.:
1. UL 567 - Pipe Connectors for Flammable Liquids and Combustible Liquids and LP-Gas.
 2. UL 842 - Valves for Flammable Fluids.
 3. UL 913 - Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous Locations.

1.5 SUBMITTALS

- A. Submittal Procedures under provisions of the Division 1.
- B. Product Data:
1. Piping: Submit data on pipe materials, fittings, and accessories. Submit manufacturers catalog information.
 2. Valves: Submit manufacturer's catalog information with valve data and ratings for each service.
 3. Fuel Piping Specialties: Submit manufacturer's catalog information including capacity, rough-in requirements, and service sizes.
 4. Day Tank: Submit manufacturer's catalog information for tank including shop drawing.
- C. Test Reports: Submit written test results for piping system pressure test.
- D. Manufacturer's Installation Instructions: Submit piping system, piping accessories and Tank Inventory and Leak Detection System

1.6 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of valves, piping system, and system components.
- B. Project Record Documents: Record actual locations of piping mains with invert elevations, valves, manholes, and leak detection and location system.
- C. Operation and Maintenance Data under provisions the Division 1. Submit spare parts lists, exploded assembly views, for tank and inventory leak detection.
- D. Day Tank manual shall include the following as a minimum:
1. Registration certificate.
 2. Glossary.

3. Equipment list.
4. Detailed description of operation.
5. Pump specifications.
6. Installation instructions.
7. Troubleshooting instructions.
8. Maintenance instructions.
9. Piping diagram.
10. Electrical drawing.
11. Exploded view parts drawing/parts list.
12. Dimensional drawing.
13. Warranty card.

1.7 QUALITY ASSURANCE

- A. Perform Work in accordance with NFPA 31.
- B. Perform Work in accordance with authority having jurisdiction.

1.8 QUALIFICATIONS

- A. Installer: Company specializing in performing work of this section with minimum three years documented experience or approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle under the provisions of the Division 1.
- B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- C. Protect piping and fittings from soil and debris with temporary end caps and closures. Maintain in place until installation.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Under the provisions of the Division 1.

1.11 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.12 COORDINATION

- A. Under the provisions of Division 1.

1.13 WARRANTY

- A. Under the provisions of Division 1.

PART 2. PRODUCTS

2.1 FUEL OIL PIPING

- A. Steel Pipe: ASTM A53/A53M or ASME B36.10M Schedule 40 black.

1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M wrought carbon steel and alloy steel welding type.
2. Joints Exterior: Welded or Viega MegaPress.
3. Joints in Mechanical Room: Threaded for pipe 2 inch and smaller or Viega MegaPress; welded for pipe 2-1/2 inches and larger.

2.2 UNIONS AND FLANGES

- A. Unions for Pipe 2 inches and Smaller:
1. Ferrous Piping: Class 150, malleable iron, threaded.
 2. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.3 GATE VALVES

- A. No allowed.

2.4 GLOBE VALVES

- A. Not Allowed.

2.5 BALL VALVES

- A. 1/4 inch to 1 inch: MSS SP 110, Class 125, two piece, threaded ends, bronze body; chrome plated bronze ball, reinforced Teflon seats, blow-out proof stem, lever handle, UL 842 listed for flammable liquids and LPG, full port.

2.6 CHECK VALVES

- A. Swing Check Valves
1. 2 inches and Smaller: MSS SP 80, Class 150, bronze body and cap, bronze seat, Buna-N disc, threaded ends.
- B. Spring Loaded Check Valves:
1. 2 inches and Smaller: MSS SP 80, Class 150 bronze body, in-line spring lift check, silent closing, Buna-N disc, integral seat, threaded ends.

2.7 OIL SAFETY VALVE (OSV)

- A. Valve shall provide automatic shut-off for the oil supply in case the line between the device and the burner is broken. UL listed for No.2 or lighter fuel oil. Valve shall require sustained vacuum on outlet side for fuel to flow. Rated for 0 to 60 psig on inlet, outlet pressure not to exceed 3 PSI. NPTF connections. Webster OSV or approved equal.

2.8 FUSIBLE LINK VALVE

- A. Brass construction with manual feature for use as a service valve, UL842 listed. Valve shall be embossed with an arrow indicating the direction of oil flow. Double seal washer/o-ring seal stem system with materials suitable for No. 2 fuel oil and Kerosene. Maximum pressure rating is 10 PSI. Firematic Fire Safety Valve or approved equal.

2.9 HANGERS AND SUPPORTS

- A. Conform to NFPA 31.

- B. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron or Carbon steel, adjustable swivel, split ring.

2.10 EXPANSION RELIEF VALVES

- A. Ductile Iron body, stainless steel cap, stainless steel relief fitting. 25 psi relief setting. Morrison Brothers Model 78DI or approved equal.

2.11 STRAINERS

- A. Manufacturers:
 - 1. Mueller Steam Specialty.
 - 2. O.C. Keckley Company.
 - 3. Spirax Sarco, Inc.
 - 4. Substitutions: Under the provisions of Division 1.
- B. 2 inch and Smaller: Y pattern, bronze body, threaded ends, Class 150, 1/32 inch stainless steel perforated screen.

2.12 FLEXIBLE CONNECTORS

- A. Manufacturers:
 - 1. Flex-Hose Co., Inc.
 - 2. Flex-Weld, Inc.
 - 3. The Metraflex Company.
 - 4. Substitutions: Under the provisions of Division 1.
- B. 2 inches and Smaller: Corrugated Type 304 stainless steel inner hose with single layer of Type 304 stainless steel exterior braiding. Maximum working pressure 200 psig.

2.13 ACCEPTABLE MANUFACTURER – DE-AERATOR / FILTER

- A. Tigerholm.
- B. Substitutions: None.

2.14 DE-AERATOR FUEL FILTERS

- A. Combination Oil De-aerator and filter with Firomatic Fusible Vavle. De-aerator converts single pipe supply to two-pipe system. Integrated 10 micron spin-on oil filter, 29 GPH Maximum Nozzle Capacity. Tigerloop Ultra S220-8.
- B. Combination Twin Oil De-aerator and filter. De-aerator converts single pipe supply to two-pipe system. Integrated 30 micron spin-on oil filter, 52.8 GPH Maximum Nozzle Capacity. Tigerloop Twin.

2.15 FUEL OIL DAY TANK

- A. Manufacturers:
 - 1. Simplex.
 - 2. Pryco.
 - 3. Tramont.
 - 4. Substitutions: Under the provisions of Division 1.

- B. General: Provide a packaged design UL-142 double-wall secondary containment construction 2.5 PSIG day tank with on-board supply duplex pumps drawing from a remote main source tank. Day tank shall be complete in all respects in order to provide a reliable source of fuel. Day tank shall provide an automatic, self-refilling fuel supply system.
- C. The day tank shall be designed and supplied as an engineered system by the manufacturer. Each tank shall be of packaged design to include all inlet flow control devices, other valves, level controls, pump control, indicators, alarms and all other devices as required to form an integrated, functional system such that field installation is restricted largely to external piping, wiring and such intermediate devices that are required by code and/or good engineering practice to interconnect the bulk source of supply to the day tank, the day tank to the prime mover and to provide for external vents as per local codes and UL142, NFPA31 and NFPA37.
- D. The system shall be for use with fuel oil as described by NFPA321, "Basic Classification of Flammable and Combustible Liquids". As defined by this standard, the fuel supply system shall be for use with "combustible liquids", those having a flash point at or above 100°F and further defined as class II or class III liquids. In no case shall a liquid defined as "flammable", or as "class I" or as having a flash point less than 100°F be used. In every case, the system shall not be used or applied at a temperature in excess of the flash point of the contents. Electrical equipment used in the system shall be in accordance with NFPA30, section 5-7, wherein it states "For areas where class II or class III liquids only are stored or handled at a temperature below their flash points, the electrical equipment may be installed in accordance with provisions of NFPA70, National Electric Code, for ordinary locations..."
- E. The system shall be designed and installed in accordance with applicable sections of NFPA30, NFPA31, NFPA37, UL80 and UL142. The day tank shall bear the label of Underwriters Laboratories standard 142 and UL508.
- F. Day tank construction:
 - 1. All welded steel atmospheric tank of rectangular, UL-142 double-wall secondary containment construction, welded construction built in accordance with codes and standards noted above for indoor use with fuel oil.
 - 2. Pipe thread connections shall be provided for fuel oil supply pump set, supply to prime mover, return from prime mover, overflow to main tank, vents, and drain valve. A weatherproof, screened vent cap shall be provided as a loose item for field installation at the outdoor vent termination.
 - 3. The tank shall be equipped with a welded steel channel base suitable for bolt attachment to a concrete pad
 - 4. The tank shall have interior corrosion inhibitor to deter corrosion prior to installation and use
 - 5. The exterior of the day tank shall receive a heavy-duty industrial anti-corrosion coating and be finish painted.
 - 6. All day tank system components shall be protected by a removable or hinged steel equipment cover.
 - 7. Day tank shall be factory leak tested at 2.5 PSI.
 - 8. The tank shall be secondary containment construction bearing the UL 142 label. The containment shall be equipped with a leak detector that shall activate the "leak" alarm described below. A drain with fire rated ball valve is to be supplied. The containment shall be equipped with a separate e-vent as required by UL 142.
 - 9. The tank shall be supplied with a piston style manual transfer pump, for use if pumps have failed.
- G. Supply fire rated ball valves as follows:
 - 1. Day tank drain

2. Secondary containment drain
- H. Fuel delivery system: Provide installed upon the day tank, a duplex fuel oil pump and duplex pump controller with automatic alternator for supply of fuel from the main tank to the day tank.
- I. Duplex pumps: 2.0 GPM at 1725 rpm, when operating with fuel oil having a viscosity of 32SSU.
1. Direct drive, motor driven pumps coupled via flexible coupling.
 2. Motors to be thermally protected, HP as indicated on schedules, required for pump at 50 PSI NEMA type B, continuous duty at 40°C, 1725 RPM, 120V AC, 60 hertz, 1.15 service factor.
 3. Pumps to be directly driven, positive displacement, internal gear type with mechanical shaft seal and cast iron body, machined steel gears.
 4. Fire rated shutoff ball valves on pump inlets
 5. Pump check valve, spring-type, cast iron construction
 6. Flows switch at each pump
 7. Suction strainer, cast iron wye type fuel oil strainer on each pump suction
 8. Provide a piston type, 0.1 gallon per stroke hand pump installed and piped and equipped with fire-rated shutoff valves.
 9. Inlet flow control solenoid valve each pump. Stainless steel construction, with fire-rated bypass valve.
 10. Supply an overflow return pump at 150% minimum capacity, of supply pump and of identical construction with overflow return pump controller.
- J. Day tank level controller. Controller shall be supplied which provides differential level control for activation of pumps, duplex pump alternator, tank level indication, system alarms, overflow return pump control and manual operating controls. Level controller shall be self-contained as a unit within a NEMA3R enclosure integral with the day tank assembly.
1. Operator interface.
 2. Fill test switch.
 3. HOA Switch.
 4. Status (Power, Filling, Not in Auto, Tank Leak).
 5. Main power disconnect.
 6. Low level alarm, sensor, input, alarm relay.
 7. Level Indicator.
 8. Auxiliary Relay dry contact outputs for the following (5A, SPDT):
 - a. Low alarms
 - b. High alarms
 - c. Leak
- K. Day tank testing:
1. The day tank shall be supplied with manufacturers test certificates as below Tank test: pressure test, leak proof test and structural integrity/appearance test.
 2. Level controller: operational test of level sensors, level indicator, level control, alarms, backup devices.

PART 3. EXECUTION

3.1 EXAMINATION

- A. Verify excavations are to required grade, dry, and not over-excavated.

3.2 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.

3.3 INSTALLATION - PIPE HANGERS AND SUPPORTS

- A. Install hangers and supports in accordance with ASTM F708, MSS SP 69 and MSS SP 89.
- B. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
- C. Place hangers within 12 inches of each horizontal elbow.
- D. Install hangers to allow 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
- E. Where installing several pipes in parallel and at same elevation, provide multiple pipe hangers or trapeze hangers.
- F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.

3.4 INSTALLATION - ABOVEGROUND PIPING

- A. Install fuel oil piping in accordance with IMC and NFPA 31.
- 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. Sleeve pipe passing through partitions, walls and floors. Refer to Section 23 05 29.
- G. Install fire stopping at fire rated construction perimeters and openings containing penetrating sleeves and piping. Refer to Division 7.
- H. Provide clearance for installation of insulation and access to valves and fittings.
- I. Provide access where valves and fittings are not exposed.
- J. Where pipe support members are welded to structural building framing, scrape, brush clean, weld, and apply one coat of zinc rich primer. Refer to Division 9.
- K. Prepare pipe, fittings, supports, and accessories not pre-finished, ready for finish painting. Refer to Division 9.

- L. Install identification on piping systems including underground piping. Refer to Section 23 05 53.
- M. Install valves with stems upright or horizontal, not inverted.
- N. Provide properly sized handles for valve operation. Handles shall not be cut or bent to make fit where installed.
- O. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

END OF SECTION

FACILITY NATURAL-GAS PIPING

PART 1. GENERAL

1.1 NOTIFICATION

- 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 WORK INCLUDED

- A. Pipe and pipe fittings.
- B. Valves.

1.3 RELATED WORK

- A. Section 23 05 00 - Common Work Results for HVAC
- B. Section 23 05 16 - Expansion Fittings and Loops for HVAC Piping.
- C. Section 23 05 19 - Meters and Gages for HVAC Piping.
- D. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment.
- E. Section 23 05 48 - Vibration and Seismic controls for HVAC Piping, Ductwork and Equipment.
- F. Section 23 05 53 - Identification for HVAC Piping, Ductwork and Equipment.

1.4 QUALITY ASSURANCE

- A. Valves: Manufacturer's name and pressure rating marked on valve body.

1.5 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Include data on pipe materials, pipe fittings, valves and accessories.

1.6 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

2.1 NATURAL GAS PIPING, ABOVE GRADE

- A. Piping: Steel Pipe ASTM A53, Schedule 40 black. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M, forged steel welding type.
- B. Joints:
 - 1. Low pressure, 2" and under: Screwed or Viega MegaPressG Cold Press Mechanical Joint. Press fittings are acceptable to last tee for connection to the appliance. Utilize threaded piping at the last tee.
 - 2. Medium pressure or larger than 2": ANSI/AWS D1.1, welded.

2.2 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. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.3 ACCEPTABLE MANUFACTURERS – GAS COCKS AND BALL VALVES

- A. Apollo.
- B. Hammond.
- C. Milwaukee.
- D. Nibco.
- E. Substitutions: Under provisions of Division 1

2.4 GAS COCKS

- A. Up to 2 Inches: Bronze body, bronze tapered plug. non-lubricated, Teflon packing, threaded ends.
- B. Over 2 Inches: Cast iron body and plug, non-lubricated, Teflon packing, flanged ends.

2.5 BALL VALVES

- A. Up to 2 Inches: Bronze two piece body, full port, forged brass, chrome plated ball, Teflon seats and stuffing box ring, lever handle, solder, threaded or press-fit ends.
- B. Over 2 Inches: Cast steel, two piece body, full port chrome plated steel ball, Teflon seat and stuffing box seals, lever handle, flanged, solder, threaded or press-fit ends.

PART 3. EXECUTION

3.1 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. Verify that excavations are to required grade, dry, and not over excavated.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom to conserve building space and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Provide clearance for installation of insulation and access to valves and fittings.
- H. Provide access where valves and fittings are not exposed. Coordinate size and location of access doors.
- I. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- J. Install valves with stems upright or horizontal, not inverted.
- K. Provide properly sized handles for valve operation. Handles shall not be cut or bent to make fit where installed.

3.3 APPLICATION

- A. Install unions downstream of valves and at equipment or apparatus connections.
- B. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

3.4 TESTING

- A. Test all piping in accordance with IFGC and UPC requirements. The test pressure used shall be no less than 10 times the proposed maximum working pressure, but not less than 10 psig for low pressure gas systems (7 inch WC) or 60 psig for medium pressures gas

systems (2 psig or 5 psig). All welded pipe shall be tested with not less than 60 psig test pressures.

END OF SECTION

HYDRONIC PIPING

PART 1. GENERAL

1.1 NOTIFICATION

- 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 WORK INCLUDED

- A. Pipe and Pipe Fittings.
- B. Valves.
- C. Heating Piping.

1.3 RELATED WORK

- A. Section 23 05 00 - Common Work Results for HVAC.
- B. Section 23 05 16 - Expansion Fittings and Loops for HVAC Piping.
- C. Section 23 05 19 - Meters and Gages for HVAC Piping.
- D. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment.
- E. Section 23 05 48 - Vibration and Seismic controls for HVAC.
- F. Section 23 05 53 - Identification for HVAC Piping, Ductwork and Equipment.
- G. Section 23 07 00 - HVAC Insulation.
- H. Section 23 09 23 - Direct Digital Control System for HVAC.
- I. Section 23 21 16 - Hydronic Piping Specialties.
- J. Section 23 21 23 - Hydronic Pumps.
- K. Section 23 52 16 - Condensing Boilers.
- L. Section 23 52 23 - Cast Iron Boilers.

1.4 REGULATORY REQUIREMENTS

- A. Conform to ANSI/ASME B31.9.

1.5 QUALITY ASSURANCE

- A. Valves: Manufacturer's name and pressure rating marked on valve body.
- B. Welding Materials and Procedures: Conform to ANSI/ASME SEC 9, and applicable state labor regulations.
- C. Welders Certification: In accordance with ANSI/ASME SEC 9.

1.6 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Include data on pipe materials, pipe fittings, valves, and accessories.
- C. Include welders certification of compliance with ANSI/ ASME SEC 9.

1.7 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of piping, valves, and components.
- B. Hydronic System Cleaning and Test reports: Submit to owner for approval. Include all cleaning and testing reports in final O&M manuals.

1.8 WARRANTY

- A. Provide warranty under provisions of Division 1.

1.9 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

2.1 HEATING PIPING, ABOVE GROUND

- A. Steel Pipe: ASTM A53, Schedule 40, for sizes 4 inch and over, black.
 - 1. Fittings: ANSI/ASTM B16.3, malleable iron or ASTM A234, steel welding type fittings.
 - 2. Joints: Screwed, or ANSI/AWS D1.1, welded.
- B. Copper Tubing: ASTM B88, Type L, hard drawn.
 - 1. Fittings Smaller than 2": 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. Fittings 2" and Larger: ANSI/ASME B16.50 Wrought Copper and Copper Alloy Braze-Joint Pressure Fittings.
 - 3. Joints: ASTM B32, solder, Grade 95TA or ANSI/AWS A5.8, BCuP silver braze; Flux: ASTM B813.

4. Press Fittings: The press fittings connections shall be compatible with seamless K, L or M copper tube made to ASTM B 88. Fittings shall have a maximum non-shock working pressure of 200 PSI between the temperatures of -20°F and +250°F. Elastomeric seals shall be made of EPDM material. Acceptable manufacturers: Viega ProPress or Nibco Press System.

C. Grooved piping systems are not allowed.

2.2 EQUIPMENT DRAINS AND OVERFLOWS

- A. Steel Pipe: ASTM A53, Schedule 40 galvanized.
 1. Fittings: Galvanized cast iron, or ANSI/ASTM B16.3 malleable iron.
 2. Joints: Screwed, or grooved mechanical couplings.
- B. Copper Tubing: ASTM B88, Type L, hard drawn.
 1. Fittings: ANSI/ASME B16.18 cast bronze, or ANSI/ASME B16.29 solder wrought copper.
 2. Joints: ASTM B32, solder, Grade 95TA or ANSI/AWS A5.8, BCuP silver braze; Flux: ASTM B813.
- C. PVC Pipe: ASTM D1785, Schedule 40, and Schedule 80 for sizes 8 inch and larger, or ASTM D2241, SDR 21 or 26.
 1. Fittings: ASTM D2466 or D2467, PVC.
 2. Joints: ASTM D2855, solvent weld.

2.3 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.

2.4 GATE VALVES

- A. Gate valves will not be permitted. Use ball or butterfly valves for isolation.

2.5 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.

2.6 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. 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.

2.7 BUTTERFLY VALVES

- A. High Performance (Double Offset) Butterfly Valves:
 - 1. Body: One-piece wafer, lug or double flanged design with extended neck to allow for 2" of piping insulation. ASME 150 Flange. Provided with top and bottom stem bearings consisting of a 316 stainless steel shell with a TFE/glass fabric liner bearing surface. Equipped with an externally adjustable stem packing system that allows packing adjustment without removing the actuator. Internal over-travel stop shall be provided to prevent over-travel of the disc and minimize possible seat damage.
 - 2. Disc: Disc edge shall be hand polished for minimum torque and maximum sealing capability.
 - 3. Stem: One-piece design provided with blow-out proof stem retention system to assure full retention of the stem in the unlikely event of an internal stem failure.
 - 4. Seat: Design shall consist of a resilient energizer totally encapsulated by the seat. Seat retainer shall be full-faced and firmly attached by bolts located outside the sealing area to protect them from corrosion. The seat assembly shall be locked in the body recess by the full-faced retainer. The seat shall be self-adjusting for wear and temperature changes. The seat shall be easily field replaceable.
 - 5. Valve shall be tested for tight shut-off per API 598 requirements.
 - 6. ANSI/NSF 61/372 Certification.
 - 7. Provide with multi position valve operator/lever handle.
 - 8. Bray/McCannalok High Performance Butterfly Valve or Approved Equal.

2.8 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.

2.9 SPRING LOADED CHECK VALVES

- A. Iron body, bronze trim, stainless steel spring, renewable composition disc, screwed, wafer or flanged ends.

2.10 VFD PUMP CHECK VALVES

- A. Center guided silent check for use with VFD Pump. ASTM A126 CL. B Cast Iron body; ASTM T304 stainless seat, plug, spring, bushing and screw. 190 PSI at 200°. Valve complies with MSS-SP-125. ANSI B16.5 steel flange connections.

2.11 RELIEF VALVES

- A. Bronze body, Teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labeled.

2.12 HYDRONIC SYSTEM CLEANER

- A. Acceptable Products:
 - 1. CH₂O Boil Out Liquid
 - 2. Oatey Hercules Boiler and Heating System Cleaner.

PART 3. EXECUTION

3.1 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.

3.2 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. Provide properly sized handles for valve operation. Handles shall not be cut or bent to make fit where installed.
- L. Press Fittings shall be installed in accordance with the manufacturer's installation instructions.
- M. 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.

3.3 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.

3.4 CLEANING OF THE HYDRONIC SYSTEM

- A. Prior to starting work, verify system is complete. Thoroughly flush and drain the system. Clean all strainer baskets and start-up screens on pump suction diffusers. Re-install strainer baskets and start-up screens and refill system.
- B. Fill the hydronic piping systems with the system cleaner in accordance with cleaning compound directions for use.
- C. Boil out system for a minimum period of four (4) hours at a system design operating temperature.
- D. Upon completion of boil out, completely flush system and drain all low points. Remove and clean and re-install all strainer baskets. Remove start-up screens on pump suction diffusers.
- E. 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 at 12 psig. Pressure system cold at 5 psig, adjust when hot to 12 psig. See Specification Section 23 21 16 for glycol fill procedures.
- F. Submit a written and signed statement to the Owner that the above referenced cleaning procedures have been completed.

3.5 TESTING

- A. Steel Piping and Copper Tubing: Test piping and tubing 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

1.1 NOTIFICATION

- 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 WORK INCLUDED

- A. Expansion Tanks.
- B. Air Vents.
- C. Air Separators.
- D. Strainers.
- E. Flow Indicators, Controls, Meters.
- F. Balance Valves.
- G. Relief Valves.

1.3 RELATED WORK

- A. Section 23 05 00 - Common Work Results for HVAC.
- B. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment.
- C. Section 23 05 48 - Vibration and Seismic controls for HVAC.
- D. Section 23 09 23 - Direct Digital Control System for HVAC.
- E. Section 23 21 23 - Hydronic Pumps.
- F. Section 23 52 16 - Condensing Boilers.
- G. Section 23 52 23 - Cast Iron Boilers.

1.4 REFERENCES

- A. ANSI/ASME - Boilers and Pressure Vessels Code.

1.5 REGULATORY REQUIREMENTS

- A. Conform to ANSI/ASME Boilers and Pressure Vessels Code Section 8D for manufacture of tanks.

1.6 QUALITY ASSURANCE

- A. Manufacturer: For each product specified, provide components by same manufacturer throughout.

1.7 SUBMITTALS

- A. Submit product data under provisions of Division 01 and Section 23 05 00.

1.8 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.

1.9 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

2.1 ACCEPTABLE MANUFACTURERS - DIAPHRAGM-TYPE COMPRESSION TANKS

- A. Amtrol.
- B. Taco.
- C. Bell & Gossett.
- D. Substitutions: Under provisions of Division 1.

2.2 DIAPHRAGM-TYPE COMPRESSION TANKS

- A. Construction: Welded steel, tested and stamped in accordance with Section 8D of ANSI/ASME Code; supplied with National Board Form U-1, rated for working pressure of 125 psig, with replaceable flexible EPDM diaphragm, sight glass and seismic restraint tabs.
- B. Accessories: Pressure gauge and air-charging fitting, tank drain; precharge to 12 psig.

2.3 ACCEPTABLE MANUFACTURERS - AIR VENTS

- A. Taco.
- B. Amtrol.

- C. Bell & Gossett.
- D. Substitutions: Under provisions of Division 1.

2.4 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 thread 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.
- C. High Capacity Automatic Air Vent: Cast iron body, stainless steel and brass trim, EPDM diaphragm, rated for 250°F, 2 PSIG through 150 PSIG, 3/4 inch system connection, 3/8 inch NPT connection to atmosphere with drain piping. Provide with isolation valve and strainer upstream of vent. Armstrong AAE-750 or equal.

2.5 ACCEPTABLE MANUFACTURERS - AIR SEPARATORS

- A. Spirotherm.
- B. Substitutions: Under provisions of Division 1.

2.6 AIR SEPARATORS

- A. Coalescing type combination air eliminator and dirt separator fabricated of steel, rated for 150 psig working pressure, stamped and registered in accordance with ASME Section VIII, Division 01 for unfired pressure vessels, and include two equal chambers above and below the inlet / outlet nozzles. Unit shall include internal elements filling the entire vessel to suppress turbulence and provide air elimination efficiency of 100% free air, 100% entrained air, and 99.6% dissolved air at the installed location. Dirt separation efficiency shall be a minimum of 80% of all particles 30 micron and larger within 100 passes. The elements must consist of a copper core tube with continuous wound copper wire medium permanently attached and followed by a separate continuous wound copper wire permanently affixed. Each unit shall have a separate venting chamber to prevent system contaminants from harming the float and venting valve operation. At the top of the venting chamber shall be an integral full port float actuated brass venting mechanism. Units shall include a valved side tap to flush floating dirt or liquids and for quick bleeding of large amounts of air during system fill or refill. Include removable lower head for internal inspection.
- B. Air Elimination Valve: Bronze, float operated, for 125 psig operating pressure.

2.7 ACCEPTABLE MANUFACTURERS - STRAINERS

- A. Bell & Gossett.
- B. Taco.
- C. Armstrong.

- D. Substitutions: Under provisions of Division 1.

2.8 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.
- B. Size 2-½ inch to 4 inch: Flanged iron body for 175 psig working pressure, Y pattern with 3/64 inch stainless steel perforated screen.
- C. Size 5 inch and Larger: Flanged iron body for 175 psig working pressure, basket pattern with 1/8 inch stainless steel perforated screen.

2.9 ACCEPTABLE MANUFACTURERS - FLOW INDICATORS

- A. Bell & Gossett.
- B. Armstrong.
- C. Taco.
- D. Substitutions: Under provisions of Division 1.

2.10 FLOW INDICATORS

- A. Brass construction, threaded for insertion into piping system, packless, with paddle with removable segments, vapor proof electrical compartment with switches.

2.11 ACCEPTABLE MANUFACTURERS - FLOW METERS

- A. Bell & Gossett.
- B. Armstrong.
- C. Taco.
- D. Substitutions: Under provisions of Division 1.

2.12 FLOW METERS

- A. Orifice principle by-pass circuit with direct reading gauge, soldered or flanged piping connections for 125 psig working pressure, with shut off valves, and drain and vent connections.
- B. Cast iron, wafer type, orifice insert flow meter for 250 psig working pressure, with read-out valves equipped with integral check valves with gasketed caps.
- C. Calibrated, plug type balance valve with precision machined orifice, readout valves equipped with integral check valves and gasketed caps, calibrated nameplate and indicating pointer.
- D. Cast iron or bronze, globe style, balance valve with handwheel with vernier type ring setting and memory stop, readout valves.

- E. Portable meter consisting of case containing one, 3 percent accuracy pressure gauge with 0-60 feet pressure range for 500 psig maximum working pressure, color coded hoses for low and high pressure connections, and connectors suitable for connection to read-out valves.

2.13 ACCEPTABLE MANUFACTURERS - BALANCE VALVES

- A. Armstrong.
- B. Taco.
- C. Bell & Gossett.
- D. Substitutions: Under provisions of Division 1.

2.14 BALANCE VALVES

- A. Valves 2" and Smaller: Bronze or brass body rated for 300 PSIG working pressure, temperature range shall be from -4°F to 250°F, type 304 Stainless Steel ball valve. Valve body shall include two pressure/temperature ports, a drain valve port and a calibrated nameplate with a memory stop. NPT or sweat end connections.
- B. Valves Larger than 2": Cast Iron body rated for 175 PSIG working pressure, temperature range shall be from -4°F to 250°F, brass ball valve. Valve body shall include two pressure/temperature ports, a drain valve port and a calibrated nameplate with a memory stop. Flanged end connections.

2.15 ACCEPTABLE MANUFACTURERS - RELIEF VALVES

- A. Watts.
- B. Taco.
- C. Bell & Gossett.
- D. Substitutions: Under provisions of Division 1.

2.16 RELIEF VALVES

- A. Bronze body, Teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labeled.

2.17 HEATING SYSTEM FILTER

- A. Construction: Continuous electric welded tube body, code semi-elliptical heads, sealed filter chamber, filter, filter support device and inlet/outlet/drain and fill port, rated for 200 psi at 200° F. Body shall be A513 tube minimum .134" thick. Heads shall be 2:1 semi-elliptical ASME code type SA-414G and a minimum of .104" thick. Dome bottom, side inlet and outlet flange fittings, three welded carbon steel legs.
- B. Filter: Filter feeder shall be supplied with 20-micron high temperature re-usable pleated filter, stainless steel holder and stainless steel removal handle so that personnel shall not come in contact with vessel contents. Provide two spare filters.

- C. Accessories:
1. Sight flow indicator to indicated flow, rated for 125 psi at 200° F.

PART 3. EXECUTION

3.1 INSTALLATION AND APPLICATION

- A. Install specialties in accordance with manufacturer's instructions to permit intended performance.
- B. Support tanks inside building from building structure, and in accordance with manufacturer's instructions.
- C. Where large air quantities can accumulate, provide enlarged air collection standpipes.
- D. Provide manual air vents at system high points and as indicated.
- E. 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.
- F. Provide air separator on suction side of system circulation pump and connect to expansion tank.
- G. Provide valved drain and hose connection on strainer blow down connection.
- H. Support pump fittings with floor mounted pipe and flange supports.
- I. Provide shutoff valves on water inlet to terminal heating units such as radiation, unit heaters, and fan coil unit.
- J. Provide balancing valves on water outlet from terminal heating units.
- K. Provide relief valves on pressure tanks, low pressure side of reducing valves, and heat exchangers.
- L. Select system relief valve capacity so that it is greater than make-up pressure reducing valve capacity. Select equipment relief valve capacity to exceed rating of connected equipment.
- M. Pipe relief valve outlet to nearest floor drain.
- N. Where one line vents several relief valves, make cross sectional area equal to sum of individual vent areas.

3.2 AIR VENT APPLICATION SCHEDULE

Location	Type
Terminal heating units, mains below	Manual
Terminal heating units, mains above	None
Heating mains, at high points in system	Automatic
Combination air separator/strainers	High capacity

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

1.1 NOTIFICATION

- 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 SUMMARY

- A. Section Includes:
 - 1. Duct Materials.
 - 2. Duct Fabrication.

1.3 RELATED SECTIONS

- A. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment: Product requirements for hangers, supports and sleeves for placement by this section.
- B. Section 23 07 00 - HVAC Insulation: Product requirements for duct liners for placement by this section.
- C. Section 23 33 00 - Air Duct Accessories: Product requirements for duct accessories for placement by this section.

1.4 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 A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 5. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - 6. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 7. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. National Fire Protection Association:

1. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.

C. Sheet Metal and Air Conditioning Contractors:

1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

D. Underwriters Laboratories Inc.:

1. UL 181 - Factory-Made Air Ducts and Connectors.

1.5 PERFORMANCE REQUIREMENTS

- A. Duct Sizes: Inside clear dimensions. For lined ducts, maintain sizes inside lining.
- B. 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.
- C. Constant Volume Supply Air Ductwork: Ductwork shall be sheet metal ductwork designed for static pressure class of +2" wg.
- D. Combustion Air Ductwork: Ductwork shall be sheet metal ductwork designed for static pressure class of -2" wg.

1.6 SUBMITTALS

- A. See General Conditions and the General Requirements in Division 01 regarding submittals.
- B. Product Data: Submit data for duct materials.

1.7 CLOSEOUT SUBMITTALS

- A. Division 1 - Execution and Closeout Requirements: Closeout procedures.

1.8 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA - HVAC Duct Construction Standards - Metal and flexible.

1.9 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 documented experience.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Division 1 - Product Requirements.
- B. Maintain manufacturers requirements for duct sealant temperatures during and after installation of duct sealant.

1.11 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.12 WARRANTY

- A. Division 1 - Execution and Closeout Requirements: Product warranties and product bonds.

PART 2. PRODUCTS

2.1 DUCT MATERIALS

- A. Galvanized Steel Ducts: ASTM A653/A653M galvanized steel sheet, lock-forming quality, having G60 zinc coating of in conformance with ASTM A90/A90M.
- B. Fasteners: Rivets, bolts, or sheet metal screws.
- C. Sealant: Non-hardening, water resistant, fire resistive, compatible with mating materials; liquid used alone or with tape, or heavy mastic. Maximum VOC content of 75 g/L.
- D. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

2.2 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 and 30 degrees convergence wherever possible. Maximum 30° divergence upstream of equipment and 45° convergence downstream.
- E. Provide standard 45-degree lateral wye takeoffs. When space does not allow 45-degree lateral wye takeoff, use 90-degree conical tee connections.
- F. 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.
- G. Plenum connections: Ensure round duct connections are welded joint bellmouth type.
- H. Use double nuts and lock washers on threaded rod supports.

PART 3. EXECUTION

3.1 EXAMINATION

- A. Verify sizes of equipment connections before fabricating transitions.

3.2 INSTALLATION

- A. Install ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- B. Seal ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to SMACNA standard duct sealing requirements per pressure construction class.
- C. During construction, install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- D. Install duct hangers and supports in accordance with Section 23 05 29.
- E. Use double nuts and lock washers on threaded rod supports.

3.3 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.

3.4 SCHEDULES

- A. Ductwork Material Schedule:

Air System	Material
Supply Air	Galvanized Steel
Return Air	Galvanized Steel
Combustion Air	Galvanized Steel

END OF SECTION

AIR DUCT ACCESSORIES

PART 1. GENERAL

1.1 NOTIFICATION

- 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 SUMMARY

- A. Section Includes:
 - 1. Volume Control Dampers.
 - 2. Duct Test Holes.
 - 3. Turning Vanes.
 - 4. Duct Silencers

1.3 RELATED SECTIONS

- A. Section 23 31 00 - HVAC Ducts and Casings.

1.4 REFERENCES

- A. Air Movement and Control Association International, Inc.:
 - 1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.
- B. Sheet Metal and Air Conditioning Contractors:
 - 1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

1.5 SUBMITTALS

- A. Division 1 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data for shop fabricated assemblies and hardware used.
- C. Product Data: Submit for the following. Include where applicable electrical characteristics and connection requirements.
 - 1. Volume control dampers.
 - 2. Duct test holes.
 - 3. Duct Silencers.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.
- B. Storage: Store materials in a dry area indoor, protected from damage.
- C. Handling: Handle and lift dampers in accordance with manufacturer's instructions. Protect materials and finishes during handling and installation to prevent damage.

1.8 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.9 WARRANTY

- A. Product warranties in accordance with Division 1.

PART 2. PRODUCTS

2.1 VOLUME CONTROL DAMPERS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.
- B. Fabricate splitter dampers of material same gauge as duct to 24 inches size in either direction, and two gauges heavier for sizes over 24 inches.
- C. Fabricate splitter dampers of single thickness sheet metal to streamline shape. Secure blade with continuous hinge or rod. Operate with minimum 1/4 inch diameter rod in self aligning, universal joint action flanged bushing with set screw.
- D. Fabricate single blade dampers for duct sizes to 9-1/2 x 30 inch.
- E. Fabricate multi-blade damper of opposed blade pattern with maximum blade sizes 12 x 72 inch. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
- F. Except in round ductwork 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.
- G. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.

2.2 DUCT TEST HOLES

- A. Cut or drill temporary test holes in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.
- B. Permanent test holes shall be factory fabricated, air tight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

2.3 TURNING VANES

- A. Double Width: Air foil design double width galvanized turning vanes with 2 inch inside radius.
- B. Single Width: Single galvanized turning vane with 2 inch radius and minimum 1" trailing straight leg.
- C. Acoustical Vanes: Double width vanes with inner vane of perforated galvanized steel with 3/32 inch holes on 5/32 inch spacing. Fill space between vanes with minimum 1.5 lb/cu ft glass fiber duct liner.

2.4 DUCT SILENCERS

- A. Silencers shall be constructed in accordance with ASHRAE and SMACNA Standards for the pressure and velocity classification specified for the air distribution system in which it is installed.
- B. Casing seams and joints shall be lock-formed and sealed or stitch welded and sealed except as noted, to provide leakage-resistant construction.
- C. Airtight construction shall be achieved by use of a duct-sealing compound supplied and installed by the contractor at the jobsite.
- D. Perforated steel shall be adequately stiffened to insure flatness and form. Spot welds shall be painted as required.
- E. Silencer assemblies, including acoustic media fill, natural cotton fiber, sealants and acoustical spacers shall have Class 1 flame spread index not exceeding 25 and smoke-developed index not exceeding 50 when tested according to ASTM E84, NFPA 255 or UL 723.
- F. The silencers shall not fail structurally when subjected to a differential air pressure of 8 inches water gauge.

PART 3. EXECUTION

3.1 EXAMINATION

- A. Verify ducts and equipment installations are ready for accessories.
- B. Check location of air outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

3.2 INSTALLATION

- A. Install temporary duct test holes as required for testing and balancing purposes. Cut or drill in ducts. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.
- B. Install silencer according to manufacturer's written installation instructions.
- C. Support duct silencers independently from ductwork.

- D. Ensure duct silencers are installed with airflow arrows in direction of airflow.

END OF SECTION

AIR OUTLETS AND INLETS

PART 1. GENERAL

1.1 NOTIFICATION

- 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 WORK INCLUDED

- A. Diffusers, Registers/Grilles.

1.3 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.

1.4 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.

1.5 REGULATORY REQUIREMENTS

- A. Conform to ANSI/NFPA 90A.
- B. Earthquake tabs, in seismic zones, in accordance with IBC Standards.

1.6 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

2.1 ACCEPTABLE MANUFACTURERS – DIFFUSERS, REGISTERS AND GRILLES

- A. Krueger.
- B. Price.
- C. Titus.
- D. Substitutions: Under provisions of Division 1.

PART 3. EXECUTION

3.1 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

1.1 NOTIFICATION

- 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. Manufactured Double Wall Chimneys for Fuel Fired Equipment.
- B. Vent Dampers.

1.3 RELATED SECTIONS

- A. Section 23 05 00 - Common Work Results for HVAC
- B. Section 23 05 48 - Vibration and Seismic controls for HVAC
- C. Section 23 52 23 - Cast Iron Boilers.

1.4 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 Z21.66 - Electrically Operated Automatic Vent Damper Devices for Use with Gas-Fired Appliances.

- H. ANSI Z21.67 - Mechanically Actuated Automatic Vent Damper Devices for Use with Gas-Fired Appliances.
- I. ANSI Z21.68 - Thermally Operated Automatic Vent Damper Devices for Use with Gas-Fired Appliances.
- J. ANSI Z95.1 (NFPA 31) - Standard for the Installation of Oil Burning Equipment.
- K. ANSI Z223.1 (NFPA 54) - The National Fuel Gas Code.
- L. ASHRAE - Handbook, Equipment Volume, Chapter "Chimney, Gas, Vent, and Fireplace Systems."
- M. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances.
- N. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.
- O. UL 103 - Standard for Factory Built Low Heat Chimneys.
- P. UL 127 - Standard for Factory Built Fireplaces.
- Q. UL 378 - Standard for Draft Equipment.
- R. UL 441 - Standard for Gas Vents.
- S. UL 641 - Standard for Low Temperature Venting Systems.
- T. UL 959 - Medium Heat Appliance Factory Built Chimneys.

1.5 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.

1.6 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.
- B. Design stack supports for wind loading of 110 mph and seismic in accordance with Section 23 05 48.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in the manufacture of products specified in this Section with minimum three years documented experience.

1.8 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.

1.9 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

2.1 MANUFACTURERS

- A. ICC Chimney.
- B. Jeremiahs.
- C. Hart & Cooley.
- D. Schebler.
- E. Van Packer.
- F. Substitutions: Under provisions of Division 1.

2.2 DOUBLE WALL METAL STACKS FOR OIL FIRED EQUIPMENT

- A. Provide insulated double wall metal stacks, tested to UL 103 HT and UL listed, for use with building heating equipment, in compliance with NFPA 211.
- B. Fabricate with 1 inch minimum air space between walls. Construct inner jacket of minimum 28 gauge ANSI/ASTM A167 Type 430 stainless steel. Construct outer jacket of Type 430 stainless steel 30 gauge, up to 8 inches in diameter for sizes 10 inches and larger minimum 28 gauge.
- C. Provide accessories each bearing factory applied UL label.
 - 1. Stack Cap: Consists of conical rainshield with inverted cone for partial rain protection with low flow resistance.
 - 2. Provide adjustable self-actuating barometric draft dampers, where indicated, full size of breeching.
 - 3. Provide cleanout doors of same gage as breeching, where indicated on Drawings.

PART 3. EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide double wall, insulated vent continuous from appliance outlet to exterior termination. Vent shall be sloped to drain to appliance condensate treatment tank. Provide all necessary connections and additional piping as required to allow system to drain to condensate treatment tanks where slope cannot be maintained.
- C. Install in accordance with recommendations of ASHRAE -Handbook, Equipment Volume, Chapter "Chimney, Gas, Vent, and Fireplace Systems", and NFPA 54.
- D. Install breechings with minimum of joints. Align accurately at connections, with internal surfaces smooth.
- E. Support breechings from building structure, rigidly with suitable ties, braces, hangers and anchors to hold to shape and prevent buckling. Support vertical breechings, chimneys, and stacks at 12 foot spacing, to adjacent structural surfaces, or at floor penetrations. Refer to SMACNA HVAC Duct Construction Standards - Metal and Flexible for equivalent duct support configuration and size.
- F. Pitch breechings with positive slope up from fuel-fired equipment to chimney or stack.
- G. Coordinate installation of dampers.
- H. For all double wall vents, maintain UL listed minimum clearances from combustibles. Assemble pipe and accessories as required for complete installation.
- I. Assemble and install stack sections in accordance with NFPA 82, industry practices, and in compliance with UL listing. Join sections with acid-resistant joint cement to ANSI/ASTM C105. Connect base section to foundation using anchor lugs.
- J. Level and plumb chimney and stacks.

BREECHINGS, CHIMNEYS, AND STACKS

Division 23

Section 23 51 00

- K. Clean breechings, chimneys, and stacks during installation, removing dust and debris.
- L. At appliances, provide slip joints permitting removal of appliances without removal or dismantling of breechings, chimneys, or stacks.
- M. For oil fired appliances, provide double wall metal stacks continuously from appliances through roof cap.
- N. No single wall vent connectors or breechings are permitted.

END OF SECTION

CAST IRON BOILERS

PART 1. GENERAL

1.1 NOTIFICATION

- 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. Boilers.
- B. Controls and Boiler Trim.

1.3 RELATED SECTIONS

- A. Section 23 05 00 - Common Work Results for HVAC.
- B. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment.
- C. Section 23 05 48 - Vibration and Seismic Controls for HVAC.
- D. Section 23 05 53 - Identification for HVAC Piping, Ductwork and Equipment.
- E. Section 23 09 23 - Direct Digital Control System for HVAC.
- F. Section 23 09 93 - Sequence of Operation.
- G. Section 23 21 13 - Hydronic Piping.
- H. Section 23 21 16 - Hydronic Piping Specialties.
- I. Section 23 51 00 - Breechings Chimneys and Stacks.
- J. Section 26 05 83 - Wiring Connections.

1.4 REFERENCES

- A. ANSI/ASME SEC4 - Boiler and Pressure Vessel Codes - Rules for Construction of Heating Boilers.
- B. ANSI/ASME SEC8D - Boilers and Pressure Vessel Codes - Rules for Construction of Pressure Vessels.
- C. ANSI/NFPA 70 - National Electrical Code.

D. ANSI/UL 726 - Oil-Fired Boiler Assemblies.

E. HI (Hydronics Institute) - Testing and Rating Standard for Cast Iron and Steel Heating Boilers.

1.5 SUBMITTALS

A. Submit product data under provisions of Division 1.

B. Submit product data indicating gross input/output, I-B-R net rating, fuel type, electrical requirements, accessories, trim, controls, general layout, dimensions, and size and location of connections.

1.6 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Division 1.

B. Include manufacturer's descriptive literature, operating instructions, cleaning procedures, replacement parts list, and maintenance and repair data.

1.7 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum three years' experience.

1.8 REGULATORY REQUIREMENTS

A. Conform to ANSI/NFPA 70 code for internal wiring of factory wired equipment.

B. Conform to ANSI/ASME SEC4 and SEC 8D for boiler construction.

C. Units: UL labeled.

1.9 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 before, during, and after installation from damage to casing by leaving factory shipping packaging in place until immediately prior to final acceptance.

1.10 WARRANTY

A. Provide warranty under provisions of Division 1.

B. Warranty: Include coverage for cast iron boiler sections.

PART 2. PRODUCTS

2.1 MANUFACTURERS

A. Buderus.

- B. De Dietrich.
- C. Weil McClain.
- D. Substitutions: Under provisions of Division 1.

2.2 MANUFACTURED UNITS

- A. Boilers shall be of a three-pass wet base, wetbacks design with optimized fins and cast iron turbulators to permit greater heat transfer. The forced draft burner shall be capable of firing the boilers pressurized combustion chamber assuring proper draft and positive ventilation. The burner shall be mounted to swing open either left or right on hinged mounting plate.
- B. Boiler sections shall be surface ground to ensure smooth positive mating surfaces. Boiler sections shall be assembled with precision-machined bi-spherical push nipples pressed into mating machinery nipple port in the section. A gas tight seal with the use of a siliconed thermocord sandwiched between sections prevents leakage of flue gases. The boiler shall be complete with a drain tapping and drain valve. Boilers shall be complete with full-swing doors that give access to all flue ways and combustion areas for easy maintenance and cleaning without burner removal
- C. Boilers approved to ANSI Z21.13 CSA 4.9-2000 standards with minimum efficiency of 85.2%. Boilers shall have no limit on inlet water temperatures. Boilers shall be constructed of eutectic cast iron sections manufactured in accordance with ASME requirements for low-pressure boilers and each section shall be permanently marked with the ASME symbol and the maximum allowable working pressures. The eutectic cast iron shall have a modulus of elasticity of 30% greater than other cast iron. The warranty on boilers should not be affected if flue gas condensation is allowed within the boiler. Boilers and burners shall be listed as a package.
- D. The complete boiler including the bottom shall be insulated with a minimum thickness of four inches of reinforced fiberglass wool insulation and shall be encased in a heavy gauge steel boiler jacket. This jacket shall be installed after system piping has been connected to the boiler section assembly. Jacket will have removable panels to allow access to the boiler as required

2.3 TRIM

- A. Combination water pressure and temperature gauge, and ASME rated pressure relief valve, sized to boiler gross output.
- B. Low water cut-off with manual reset to automatically prevent burner operation when boiler water falls below safe level, with power failure automatic reset.
- C. Operating temperature controller to maintain boiler water temperature.
- D. Redundant high limit temperature controller for burner to prevent boiler water temperature from exceeding safe system temperature.
- E. Boiler air vent.
- F. Drain Valve.

2.4 FUEL BURNING SYSTEM

- A. Provide a forced draft flame retention type UL listed automatic burner assembly. The burner shall be able to fire on natural gas and fuel oil. Burner construction, design, components and installation shall adhere to all applicable code requirements. Basis of design: Riello Model RLS100E.
- B. Each boiler shall be equipped with a complete factory packaged combustion and fuel supply system, with integrally mounted fuel/air ratio controls for single-location accessibility.
- C. Burner operation will be full modulation. Burner shall operate with minimal vibration and noise at the specified rate. The burner must operate with 15% – 20% excess air and CO must be less than 15 ppm in the products of combustion.
- D. Burner housing shall be die cast aluminum "monobloc" type construction. The burner mounting flange must support the burner weight on the boiler independent of any support.
- E. Burner shall be furnished with a stainless-steel flame retention type of combustion head, capable of withstanding temperatures up to 1400 Deg F. This combustion head shall incorporate a diffuser and sleeve that is to direct excess air either around the flame or directly through the diffuser vanes. Adjustment to the diffuser insertion shall be made external to the burner and can be made while burner is in full operation.
- F. Burner shall be equipped with service slide bars that allow for full access to the burner drawer assembly without removing the burner chassis from the boiler.
- G. Burner shall have a flame inspection window positioned at the rear center of the burner housing. Flame shall be viewed without removing any covers.
- H. Burner shall come complete with a high efficiency, totally enclosed fan cooled motor and a dynamically balanced reversed incline blower wheel.
- I. The sound rating of the burner shall not exceed 85 dBA when measured at 3 feet from the burner.
- J. Electronic Linkageless Burner Management System: Siemens LMV3 with AZL Service Display shall provide the flame safeguard control and firing rate modulation capabilities.
- K. A protection screen shall be installed on the air intake housing.

2.5 CONTROLS

- A. Boiler controls shall be housed in a factory pre-wired control cabinet with the burner. Control panel shall include all necessary motor starters, overloads, lights and switches. Burner shall be supplied with an integral AUTO/MANUAL/OFF switch that incorporates a control toggle that will allow a technician to manually drive the burner servomotor from low fire to high fire or high fire to low fire and the means to stop at any position in between, in a smooth and controlled method. The cabinet shall house combustion Safeguard Control to provide prepurge, postpurge and burner sequencing, complete with flame rod. Panel shall include the following:
 - 1. Motor starters with overload protection for blower motor.
 - 2. On/off switch.
 - 3. Low/auto switch.
 - 4. Step down transformer for 120-volt output. With circuit fuse if power supply is 3 phase.
 - 5. Individual pilot lights with nameplated to indicate: "Power On", "Main Fuel Valve On", and "Flame Failure".
 - 6. Electronic safety combustion controls shall be supplied to monitor pilot and main flame. Detection will be means of a flame rod. The programming control shall be a Siemens, model LMV and will provide pre and post purge, trial for ignition, energize main fuel circuit, interrupted type pilot and sequence operation.

7. Manual restart of each burner shall be necessary in the event of a shutdown due to flame failure.
- B. Burner controls shall incorporate wiring connections for interface to the direct digital control system. Provide as a minimum the following hard wired interface connections to DDC system:
 1. Boiler Enable/Disable.
 2. Boiler Status.
 3. Boiler Flame Failure.
 4. Boiler Remote Firing Rate Signal.
 5. Boiler Fuel Oil/Natural Gas Mode.

2.6 FUEL TRAIN COMPONENTS

- A. FM approved gas train with main gas pressure regulator, vented to outside atmosphere, in accordance with local codes, approved automatically operated motorized safety gas shutoff valve, with proof of closure interlock switches, second automatically operated gas safety, manually operated gas shutoff valve located downstream of both automatic gas valves to permit leakage testing of valves, test pressure tapings upstream and downstream of each valve and regulator, air damper with high-low control linkage.
- B. A factory mounted oil pump set shall be mounted to the boiler assembly and shall be directly driven by a motor independent from the combustion air motor. The oil pump must have an integral regulator to adjust the flow of oil to burner nozzles. There shall be three safety shut off valves (main safety, first stage, and second stage). All piping on the burner valve train must be factory installed. Field connections must be NPT. All wiring of oil train valves and switches must be done at the factory.
- C. The boiler shall not require a compressed air supply to fire on #2 fuel oil.
- D. Standard CSD-1 fuel trains shall comply with FM Global requirements.

2.7 PERFORMANCE

- A. Performance rating shall be in accordance with AHRI - Performance Rating of Commercial Space Heating Boilers.

PART 3. EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions. Field assemble boilers using press tools approved by manufacturer.
- B. Provide for connection to electrical service. Refer to Section 26 05 83.
- C. Pipe relief valves to nearest floor drain.
- D. Pipe gas regulator relief valve full size to exterior.

3.2 MANUFACTURER'S FIELD SERVICES

- A. Prepare and start systems under provisions of Division 1.

- B. Upon notification of completion of the installation, boiler manufacturer shall furnish the services of a field technician, to start the boiler and provide combustion tests over the operating range and issue report to the Consultant indicating system acceptance as installed.
- C. Instruct operating personnel, provide a minimum of 4 hours training on operation and maintenance of boiler, burner and boiler controls.
- D. Coordinate all work with Specification Section 23 09 93. Perform start-up in conjunction with testing of DDC systems to ensure alarm interface and system operations are complete and fully functional.
- E. Submit written report after start-up including control settings and performance chart of control system.
- F. Provide boiler set-up and adjustment before firing. Submit results of combustion test prior to final acceptance, including: Overfire and flue collar draft, CO₂ (CO for gas), net stack temperature, smoke number, and percent efficiency. Tests are to be run by approved technician specializing in boiler maintenance.

END OF SECTION

COMMON WORK RESULTS FOR ELECTRICAL

PART 1. GENERAL

1.1 NOTIFICATION

- 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. 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.

1.3 WORK SEQUENCE

- A. Construct Work in sequence under provisions of Division 1.

1.4 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.

1.5 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. 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.
- E. 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.

1.6 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. Obtain electrical permits, plan review, and inspections from authority having jurisdiction.

1.7 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.

1.8 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.

1.9 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 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.

1.11 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.

PART 2. PRODUCTS

2.1 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

3.1 WORKMANSHIP

- A. Install Work using procedures defined in NECA Standard of Installation and/or the manufacturer's installation instructions.

3.2 TESTS

- A. Notify the Owner's representative at least 72 hours prior to conducting any tests.
- B. Perform additional tests required under other sections of these specifications.
- C. Perform all tests in the presence of the Owner's representative.

3.3 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.

END OF SECTION

SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1. GENERAL

1.1 NOTIFICATION

- 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. Electrical Demolition.

1.3 RELATED SECTIONS

- A. Division 1 - Alteration Project Procedures.
- B. Division 2 - Minor Demolition for Remodeling.

PART 2. PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work: As specified in individual Sections.

PART 3. EXECUTION

3.1 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 Owner before disturbing existing installation.
- D. Beginning of demolition means installer accepts existing conditions.

3.2 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.

- B. 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.
- C. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from Owner at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

3.3 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 abandoned distribution equipment.
- H. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- I. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.
- J. 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.
- K. Maintain access to existing electrical installations which remain active.
- L. Extend existing installations using materials and methods as specified.
- M. 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.
- N. Relocate existing lighting fixtures as indicated on Drawings. Test fixture to see if it is in good working condition before installation at new location.

3.4 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.

3.5 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.
- C. Luminaires: Remove existing luminaires for cleaning. Use mild detergent to clean all exterior and interior surfaces, rinse with clean water and wipe dry. Replace lamps[, ballasts, drivers] and broken electrical parts.

3.6 INSTALLATION

- A. Install relocated materials and equipment under the provisions of Division 1.

3.7 DISPOSAL

- A. Dispose of all hazardous waste in accordance with all local, State and Federal requirements.

END OF SECTION

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1. GENERAL

1.1 NOTIFICATION

- 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. Building Wire.
- B. Cable.
- C. Wiring Connections and Terminations.

1.3 RELATED SECTIONS

- A. Section 26 05 53 – Identification for Electrical Systems.

1.4 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 1479 – Standard for Fire Tests of Through Wall Penetration Fire Stops.
- F. UL 1581 – Reference Standard for Electrical Wires, Cables and Flexible Cords.

1.5 SUBMITTALS

- A. Submittals are not requested for this section.

1.6 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

2.1 BUILDING WIRE

- A. Thermoplastic-insulated Building Wire: NEMA WC 70.
- B. Feeders and Branch Circuits Larger Than 6 AWG: Copper, stranded conductor.
- C. Feeders and Branch Circuits 6 AWG and Smaller: Copper conductor, 6 and 8 AWG, stranded conductor; smaller than 8 AWG, solid or stranded conductor.
- D. Insulation Type: 600 volt insulation.
 - 1. Interior Locations: THHN/THWN or XHHW-2. THW may be used for feeders and branch circuits larger than 6AWG.
 - 2. Exterior Locations: XHHW-2.
- E. 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.
 - b. Brown, orange, yellow and gray for 277/480V 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.
- F. Control Circuits: Copper, stranded conductor 600 volt insulation, THHN/THNN or XHHW-2.
- G. Fire Alarm Notification Appliance Circuits: Copper, solid or stranded conductor 600 volt insulation, THHN/THNN or XHHW-2.

2.2 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.

2.3 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. Motor connections: Spring wire connectors, pre-insulated "twist-on" rated 105 degrees C per UL 468C. Provide a minimum of 8 wraps of Scotch 33+ electrical tape around conductors and connector to eliminate connector back off.
- B. For conductors 6 AWG and larger:
 - 1. Bus lugs and bolted connections: 600 V, 90 degrees C., two hole long barrel irreversible compression copper tin plated. Thomas & Betts or approved equal.
 - 2. Motor connection: 600 V, 90 degrees C., copper tin plated compression motor pigtail connector, quick connect/disconnect, slip on insulator. Thomas & Betts or approved equal.
 - 3. Two way connector for splices or taps: 600 V, 90 degrees C., compression long barrel, copper tin plated. Thomas & Betts or approved equal. Insulate with Scotch 23 rubber insulating base covering and Scotch 33+ outer wrap.

PART 3. EXECUTION

3.1 GENERAL WIRING METHODS

- A. Use no wire smaller than 12 AWG for power and lighting 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, and for 20 ampere, 277 volt branch circuit home runs longer than 200 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.

3.2 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. Use UL listed wire pulling lubricant for pulling 4 AWG and larger wires.
- 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.

3.3 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.
- 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.

3.4 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.

3.5 WIRE AND CABLE INSTALLATION SCHEDULE

- A. All Locations: Building wire and/or remote control and signal cable in raceways.

END OF SECTION

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1. GENERAL

1.1 NOTIFICATION

- 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. 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.

1.3 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.

1.4 REFERENCES

- A. International Building Code (IBC), Chapter 16 – Structural Design.

1.5 SUBMITTALS

- A. Submittals are not requested for this section.

1.6 QUALITY ASSURANCE

- A. Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry.

PART 2. PRODUCTS

2.1 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.

2.2 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 to 2 inches on center.

PART 3. EXECUTION

3.1 EXAMINATION

- A. Division 1: Verification of existing conditions before starting work.

3.2 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.

3.3 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.

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

Division 26

Section 26 05 29

- C. Do not fasten supports to piping, ductwork, mechanical equipment, conduit, or ceiling suspension system.
- D. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.
- E. Install surface-mounted cabinets and panelboards with minimum of four anchors.
- F. Securely fasten fixtures and equipment to building structure in accordance with manufacturer's recommendations and to provide necessary earthquake anchorage.
- G. Earthquake Anchorages:
 - 1. Equipment weighing more than 50 pounds shall be adequately anchored to the building structure to resist lateral earthquake forces.
 - 2. Total lateral (earthquake) forces shall be 1.5 times the equipment weight acting laterally in any direction through the equipment center of gravity. Provide adequate backing at structural attachment points to accept the forces involved.

END OF SECTION

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1. GENERAL

1.1 NOTIFICATION

- 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. Conduit.
- B. Boxes.
- C. Wireway

1.3 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.
- B. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.
- C. Section 26 05 29 – Hangers and Supports for Electrical Systems.
- D. Section 26 05 53 – Identification for Electrical Systems.
- E. Section 26 27 26 – Wiring Devices.

1.4 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).

1.5 RACEWAY AND BOX INSTALLATION SCHEDULE

- A. Concealed Dry Locations:
 - 1. Raceway: Provide rigid steel conduit, intermediate metal conduit, or electrical metallic tubing.
 - 2. Boxes and Enclosures: Provide sheet-metal boxes. Provide vapor barrier boxes in exterior walls and the ceiling.
 - 3. Fittings: Provide galvanized malleable iron and steel.
- B. 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.
- C. Equipment Connections: Provide short extensions (three feet maximum) of flexible metal conduit for connections to light fixtures, motors, transformers, vibrating equipment or equipment that requires removal for maintenance or replacement. Use Liquidtight flexible conduit and fittings for motors and equipment in damp or wet locations or subject to spilling of liquids as at pumps, kitchen equipment, in mechanical rooms, boiler rooms, pump rooms, etc.

1.6 DESIGN REQUIREMENTS

- A. Raceway Minimum Size:
 - 1. Above Grade or Within Slab: 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.
- B. Box Minimum Size: Provide all boxes sized and configured per NEC Article 370 and as specified in this section.

1.7 SUBMITTALS

- A. Submit product data under provisions of Division 1.
- B. Product Data: Submit data for products.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

PART 2. PRODUCTS

2.1 RIGID METAL CONDUIT (RMC)

- A. Rigid Steel Conduit: ANSI C80.1, UL 6.
- B. 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. [Provide copper free aluminum fittings and conduit bodies with Aluminum Conduit.]
- C. Provide insulated throat bushings at all conduit terminations.

2.2 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.

2.3 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.

2.4 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.

2.5 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3, UL 797; galvanized steel tubing.
- B. Fire Alarm EMT: Provide EMT with factory or field-applied red topcoating.
- C. 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 indenter fittings are not acceptable.
- D. Provide factory elbows on sizes 1-1/2" and larger.

2.6 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. Luminaire and 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.
- 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.
- C. Wall Plates: As specified in Section 26 27 26 – Wiring Devices.

2.7 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.

2.8 EXPANSION FITTINGS

- A. Galvanized malleable iron, galvanized with grounding bond jumper.

2.9 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.

2.11 WIREWAY

- A. Product Description: General purpose type wireway.
- B. Size per NEC minimum fill capacity unless otherwise indicated on Drawings.
- C. Knockouts: Field-installed, no factory knockouts acceptable.
- D. Cover: Screw cover. Provide raintight where installed outdoors.
- E. Fittings and Accessories: Include factory couplings, offsets, elbows, adapters and support straps required for a complete system. Provide internal ground bonding jumper bonded to each section.

PART 3. EXECUTION

3.1 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.

3.2 INSTALLATION - GENERAL RACEWAY

- A. Install raceway for all systems, unless otherwise noted.
- 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 where installed at surface cabinets, motor 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. 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.
- I. 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.
- J. Arrange raceway supports to prevent misalignment during wiring installation.
- K. 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.

- L. 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.
- M. Cut conduit square; de-burr cut ends. Bring conduit to the shoulder of fittings and couplings and fasten securely.
- N. 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.
- O. Install no more than 360-degrees of bends between boxes.
- P. Install conduit bodies to make sharp changes in direction, such as around beams. "Goosenecks" in conduits are not acceptable.
- Q. Use hydraulic one-shot conduit bender or factory elbows for bends in conduit larger than 2 inch size.
- R. 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.
- S. Install fittings designed and listed to accommodate expansion and contraction where raceway crosses control and expansion joints.
- T. Use cable sealing fittings forming a watertight non-slip connection to pass cords and cables into conduit. Size cable sealing fitting for the conductor outside diameter. Use Appleton CG series or equal cable sealing fittings.
- U. Use suitable caps to protect installed raceway against entrance of dirt and moisture.
- V. Provide nylon "jet-line" or approved equal pull string in empty raceway, except sleeves and nipples.
- W. 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.

3.3 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.

3.4 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.
- 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.
- 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. Provide knockout closures for unused openings.
- E. Install boxes in walls without reducing effectiveness of wall insulation or vapor barrier.
- F. Do not fasten boxes to ceiling support wires or other piping systems.
- G. Support boxes independently of conduit.
- H. Clean interior of boxes to remove dust, debris, and other material and clean exposed surfaces and restore finish.
- I. Provide blank covers or plates for all boxes that do not contain devices.
- J. Paint all exposed boxes in finished spaces to match surface to which it is attached to. Clean greasy or dirty boxes prior to painting in accordance with paint manufacturer's instructions.

3.5 INSTALLATION – WIREWAY

- A. Bolt wireway to steel channels fastened to the wall or ceiling or in self-supporting structure. Install level.
- B. Mount wireway per manufacturer's installation instructions.

END OF SECTION

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1. GENERAL

1.1 NOTIFICATION

- 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. Nameplates
- B. Tape Labels.
- C. Wire and Cable Markers.

1.3 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 19 – Low-Voltage Electrical Power Conductors and Cables.
- C. Section 26 05 33 – Raceway and Boxes for Electrical Systems.
- D. Section 26 27 26 – Wiring Devices.

1.4 SUBMITTALS

- A. Submittals are not requested for this section.

1.5 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

2.1 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.

2.2 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.

2.3 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.

PART 3. EXECUTION

3.1 GENERAL INSTALLATION

- A. Degrease and clean surfaces to receive nameplates and tape labels.
- B. Install nameplates and tape labels parallel to equipment lines.

3.2 NAMEPLATE INSTALLATION

- A. Secure nameplates to equipment fronts using machine screws tapped and threaded into panelboard, or using rivets. The use of adhesives is not acceptable. Machine screws to not protrude more than 1/16 inch on back side.
- B. Disconnects, Starters, or 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.

3.3 LABEL INSTALLATION

- A. Spare Raceways: Provide raceway label on each individual raceway denoting the source and termination point at each end.
- B. Low-Voltage System Device Labels: Provide label on each device, denoting device ID or address where applicable. Affix label to device faceplate for ceiling-mounted devices or wall-mounted devices above 8'-0" AFF. Affix label inside backbox for exterior devices.

3.4 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. Fire Alarm Circuits: Provide cable markers showing NAC or SLC loop identification number at all fire alarm junction boxes and 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.

3.5 JUNCTION BOX IDENTIFICATION

- A. Label each lighting and power junction box with the panelboard name and circuit number.
- B. Label all junction boxes for intercom, door control, CCTV, MATV, and CATV systems with the type of system cables contained in the box.
- C. 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.

3.6 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.

3.7 PANELBOARD IDENTIFICATION

- A. Provide panelboard circuit directories where circuits are modified or added.

END OF SECTION

WIRING DEVICES

PART 1. GENERAL

1.1 NOTIFICATION

- 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. Receptacles.
- B. Device Plates and Box Covers.

1.3 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 33 – Raceway and Boxes for Electrical Systems.
- C. Section 26 05 53 – Identification for Electrical Systems.

1.4 REFERENCE STANDARDS

- A. FS W-C-596 – Federal Specification for Electrical Power Connector, Plug, Receptacle, and Cable Outlet.
- B. NEMA WD 1 - General Color Requirements for Wiring Devices.
- C. ANSI/NEMA WD 6 – Wiring Devices – Dimensional Requirement.
- D. UL 498 - Attachment Plugs and Receptacles.
- E. UL 943 – Ground-Fault-Circuit-Interrupters.

1.5 SUBMITTALS

- A. Submittals are not requested for this section.

PART 2. PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - RECEPTACLES

- A. Hubbell.
- B. Leviton.
- C. Pass & Seymour.
- D. Arrow Hart
- E. Substitutions: Under provisions of Division 1.

2.2 RECEPTACLES

- A. Convenience and Straight-blade Receptacles: UL 498, ANSI/NEMA WD-6 and Federal Specification FS W-C-596 industrial grade receptacle.
- B. Convenience Receptacle Configuration: ANSI/NEMA WD-6; Type 5-20R, white nylon face.
- C. GFCI Receptacles: ANSI/NEMA WD-6; 20A, duplex convenience receptacle with integral class 'A' ground fault current interrupter, LED indicator lamp and integral lockout.

2.3 DEVICE PLATES

- A. Decorative Cover Plate: Smooth 430 or 302 stainless steel. White with metal, counter sunk screws to match device plate.
- B. Exposed Work Cover Plate: ½ inch raised, square, pressed, galvanized or cadmium plated steel cover plate supporting devices independent of the outlet box.

PART 3. EXECUTION

3.1 INSTALLATION

- A. Install convenience receptacles 18 inches above floor, 4 inches above counters or backsplash, grounding pole on bottom.
- B. Install specific-use receptacles at heights shown on Contract Drawings.
- C. Unless otherwise noted, mounting heights are for finished floor to center line of outlet.
- D. Install decorative plates on switch, receptacle, and blank outlets in finished areas. Use midsize or jumbo plates for outlets installed in masonry walls, where required to cover up imperfections in the wall opening.
- E. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface-mounted outlets.
- F. Install devices and wall plates flush and level.

- G. Ground receptacles to boxes with a grounding wire. Grounding through the yoke or screw contact is not an acceptable alternate to the ground wire.
- H. Install circuit label on each receptacle and light switch in accordance with Section 26 05 53.

END OF SECTION

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1. GENERAL

1.1 NOTIFICATION

- 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. Enclosed Switches.

1.3 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 53 – Identification for Electrical Systems.

1.4 REFERENCE STANDARDS

- A. ANSI/UL 98 Enclosed and Dead Front Switches.
- B. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
- C. NEMA 250 – Enclosures for Electrical Equipment (1000 Volts Maximum).
- D. NETA ATS – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.5 SUBMITTALS

- A. Product Data: Submit product data for all components provided, showing electrical characteristics, material, and dimensions. Each catalog sheet should be clearly marked to indicate exact part number provided, including all options and accessories.

1.6 CLOSEOUT SUBMITTALS

- A. Project Record Drawings: Accurately indicate actual location of enclosed switches, circuit breakers and ratings of actual installed fuses.

1.7 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

PART 2. PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - ENCLOSED SWITCHES

- A. Schneider/Square D.
- B. Siemens.
- C. Eaton.
- D. General Electric.
- E. Substitutions: Under provisions of Division 1.

2.2 ENCLOSED SWITCHES

- A. Nonfusible Switch Assemblies: NEMA KS 1; Heavy Duty type; quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position.
- B. Enclosures: NEMA KS 1; Type 1, 3R or 4 as indicated on Drawings or appropriate for the installed environment.

PART 3. EXECUTION

3.1 INSTALLATION

- A. Install enclosed switches where indicated on Drawings, and where required for NEC required disconnect of equipment specified under other divisions, but installed under Division 26.

END OF SECTION

ENCLOSED CONTROLLERS

PART 1. GENERAL

1.1 NOTIFICATION

- 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. Manual Motor Starters.
- B. Magnetic Motor Starters.

1.3 RELATED SECTIONS

- A. Division 22 – Plumbing.
- B. Section 26 05 29 – Hangers and Supports for Electrical Systems.
- C. Section 26 05 53 – Identification for Electrical Systems.

1.4 REFERENCES

- 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.
- B. ANSI/NEMA ICS 6 - Enclosures for Industrial Controls and Systems.
- C. NEMA ICS 2 - Industrial Control Devices, Controllers, and Assemblies.

1.5 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Division 1.
- B. Provide product data on motor starters and combination motor starters, relays, pilot devices, and switching and overcurrent protective devices.

PART 2. PRODUCTS**2.1 ACCEPTABLE MANUFACTURERS - MOTOR STARTERS**

- A. Schneider/Square D.
- B. Allen Bradley.
- C. Siemens.
- D. Eaton.
- E. Substitutions: Under provisions of Division 1.

2.2 MANUAL MOTOR STARTERS

- A. Fractional Horsepower Manual Starter: NEMA ICS 2; AC general-purpose Class A manually operated, number of poles as required by the load served, full-voltage controller for fractional horsepower induction motors, with thermal overload unit, red pilot light, and toggle operator.
- B. Enclosure: ANSI/NEMA ICS 6; Type 1, 3R or 4, as appropriate for the installed environment.

2.3 MAGNETIC MOTOR STARTERS

- A. Magnetic Motor Starters: NEMA ICS 2; AC general-purpose Class A magnetic controller for induction motors rated in horsepower.
- B. Full Voltage Starting: Non-reversing type.
- C. Coil Operating Voltage: 120 volts, 60 Hertz.
- D. Size: NEMA ICS 2; size as required by the load served.
- E. Overload Relay: NEMA ICS 2; bimetal.
- F. Enclosure: NEMA ICS 6; Type 1 as shown on the drawings.
- G. Combination Motor Starters: Combine motor starters with motor circuit protector.
- H. Auxiliary Contacts: NEMA ICS 2; two field convertible contacts in addition to seal-in contact.
- I. Indicating Lights: NEMA ICS 2; RUN: red LED light in front cover.
- J. Selector Switches: NEMA ICS 2; HAND/OFF/AUTO, in front cover.
- K. Control Power Transformers: 120 volt secondary, VA capacity as required by the load served in each motor starter.
- L. Power Monitor: Include a three-phase power monitor in each magnetic starter connected to shut down the motor on loss of any phase, phase reversal, or low voltage on any phase. Power monitor shall automatically reset and restart motor when phase and voltage conditions return to normal. Provide oversize starter enclosures as required to install power monitor.

2.4 CONTROLLER OVERCURRENT PROTECTION AND DISCONNECTING MEANS

- A. Motor Circuit Protector: NEMA AB 1; circuit breakers with integral instantaneous magnetic trip in each pole.

PART 3. EXECUTION

3.1 INSTALLATION

- A. Install motor control equipment in accordance with manufacturer's instructions.
- B. Select and install heater elements in motor starters to match installed motor characteristics.
- C. Motor Data: Provide neatly typed label inside each motor starter enclosure door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating.
- D. After final connections are made, check and correct the rotation of all motors.
- E. Field adjust the trip settings of all motor starter magnetic trip only circuit breakers to approximately 11 times motor full load current. Determine full load current from motor nameplate following installation.
- F. Motor starting equipment shall be listed for use with the motors specified under Division 22.

END OF SECTION

Community Workforce Agreement

for the

_____ (Project name)

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PREAMBLE

The Anchorage School District (Public Entity/Owner, hereinafter referred to as "Owner" or "District"), is committed to securing the best value for public construction funds, and to putting such funds to work for the benefit and improved general welfare of residents of the community, and in particular, community members in focus categories such as military veterans, members of the National Guard and reservists; adults skilled in the construction trades; people of color; women; District graduates, young people and unskilled adults, socially and economically disadvantaged members of the community; and individuals facing reentry into the community after leaving a State of Alaska correctional facility. The Building and Construction Trades Council of Southcentral Alaska (hereinafter, the "Council") is committed to preserving work traditionally performed by community members represented by the Council and its member organizations, and to creating employment opportunities for such individuals as well as for community members in the Owner's priority categories.

The Owner seeks to expand training and employment opportunities for District graduates, to gain ready access to a competent workforce for current as well as future projects, and to secure cost savings by employing skilled apprentices to work with more experienced workers on public construction projects. The Council seeks to participate in creating the workforce of the future, and to making such cost savings available to the Owner on present and future construction projects.

To these ends, the Council and its member organizations agree to provide the Owner, its contractors and subcontractors, with viable tools, including bona fide apprenticeship and training programs with proven track records of graduating skilled apprentices, and hiring and job referral systems designed to prioritize area resident and special applicant employment preferences as described above in Paragraph 1. The Owner agrees the interests of the community will be served by the utilization of these tools, and that the Owner can effectively achieve the goals stated herein by utilizing a Community Workforce Agreement (hereinafter the "CWA") to build projects constructed with public funds.

ARTICLE 1 PRODUCTIVITY

1.1 This CWA is intended to ensure that all construction work on the _____ (Public Project, hereinafter, the "Project") proceeds without interruption or delay, that all participants work cooperatively in accordance with the highest standards of excellence and professionalism, and that disputes are resolved in an effective, expeditious manner.

ARTICLE 2 FAIR CONTRACTING OPPORTUNITIES

2.1 This CWA is intended to provide access to fair and competitive work opportunities for all contractors, and subcontractors. The Owner or Contractor, as appropriate, has the right to select all qualified bidders or subcontractors to perform work on the Project subject only to the Letter of Assent requirement set forth in Article 8.

2.2 The Council and all signatory labor organizations shall work cooperatively with the Owner, Contractor and all subcontractors awarded work on the Project regardless of whether the Contractor or subcontractors have performed or are performing work on other projects under contract with the Council or any labor organization signatory to this CWA (hereinafter, "signatory labor organization").

2.3 The Owner and/or the Project Contractor have the absolute right to select any qualified bidder for the award of contracts on this Project without reference to the existence or non-existence of any agreements between such bidder and any party to this Agreement; provided, however, only that such bidder is willing, ready and able to become a party to and comply with this Project Agreement, should it be designated the successful bidder.

ARTICLE 3 THE PARTIES

3.1 This CWA is entered into by Contractor selected by the Owner to be responsible for construction of the Project (hereinafter, the "Contractor"), for and on behalf of itself and its subcontractors of any tier, the Building and Construction Trades Council of South-Central Alaska (hereinafter, the "Council") and all signatory labor organizations. The Owner, Contractor, all subcontractors, the Council and signatory labor organizations may be referred to individually as a "Party" and collectively as the "Parties."

ARTICLE 4 TERM OF AGREEMENT

4.1 This CWA shall become effective on the ____ day of _____, 20__ and shall continue in full force and effect until completion of all Covered Work. Termination of this CWA shall occur upon receipt by the Council of written notice from the Owner, of Project completion.

ARTICLE 5 CONSTRUCTION OF THE PROJECT

5.1 This CWA shall apply to all phases of construction of the Project, from site preparation, startup through clean-up, including rework, change orders and extensions of the Project, to completion certified in writing by the Owner. Construction of the Project will be undertaken pursuant to a contract between the Owner and the Contractor pursuant to contract documents executed between the Owner and the Contractor (hereinafter, the "Contract"). The Owner, at its sole option, may terminate, delay and/or suspend any or all portions of the Project at any time.

5.2 The Owner will implement this Article by including appropriate, binding provisions in the Contract and Solicitation documents establishing execution of and compliance with this CWA as conditions of the job award and construction of the Project.

ARTICLE 6 COVERED WORK AND SERVICES

6.1 This CWA shall apply to all activities engaged in or performed at the direction of the Contractor pursuant to the Contract, and by subcontractors awarded contracts to perform work on the Project (hereinafter, "Covered Work"). Covered work shall include all construction work traditionally performed by workers represented by the Council or members of the Council, including site preparation, dedicated off site lay down yard to the extent permitted by law, storage yard work, supply and delivery of concrete, and surveying. The site of construction is defined as _____ (hereinafter, the "Work Site") and shall refer to all locations at which the Contractor or subcontractors perform Covered Work.

6.2 This CWA applies only to covered work performed on the specific project Work Site listed above. It does not apply to, nor any rights of the parties under this agreement extended to, Contractors or sub-Contractors work on other projects outside the Covered Work of this agreement.

6.3 Nothing contained herein shall be construed to prohibit, restrict, or interfere with the performance of any other operation, work, or function which may occur at the Project site or be associated with the development of the Project.

6.4 This Agreement shall only be binding on the signatory parties hereto and shall not apply to their parents, affiliates, or subsidiaries.

**ARTICLE 7
EXCLUDED WORK AND SERVICES**

- 7.1 The following work is excluded from the scope of this CWA:
- a. Non-manual work
 - b. Work performed by employees employed by the Owner.
 - c. Any work performed on, near, leading to, or into the Project Site by State, County, City or other governmental bodies, their contractors, or by public or private utilities or their contractors.
 - d. On and off-site maintenance of leased equipment and on-site supervision of such work.
 - e. Required equipment warranty work, and the onsite supervision of such work.
 - f. Startup, commissioning, specialty testing or inspections done by the Owner, Contractor or Subcontractors, unless such work is traditionally performed by employees represented by the Council or its members, in which case it is not excluded.
 - g. Off-site manufacture of materials, equipment, or machinery; the repair, maintenance, assembly, painting, handling or fabrication of components; or, work involved in deliveries to and from the Work Site; however, when subcontracting for prefabrication of materials to be installed on the Project, such prefabrication shall be subcontracted to fabricators who pay their employees engaged in such fabrication not less than the appropriate Alaska prevailing wage for comparable fabrication, as set by Alaska Statute Title 36, Public Contracts.
 - h. Furniture, fixture and equipment installation and other work performed after the Contractor and Subcontractors have completed construction work and or after the Contract completion date.
 - i. Any work within the historic jurisdiction of the Outside Construction Branch of the International Brotherhood of Electrical Workers Local Union 1547.

ARTICLE 8 COMPLIANCE WITH AGREEMENT

8.1 All Covered Work will be contracted only to the Contractor and those subcontractors who agree to become and remain signatory to this CWA for the duration of the Project. The Contractor and all subcontractors shall fulfill this commitment by executing a Letter of Assent ([Attachment 1](#)) prior to commencing Covered Work. A signed copy of the Letter of Assent shall be transmitted immediately upon execution to the President of the Council as condition of the dispatch of employees to the Work Site. The Contractor shall monitor and enforce compliance with this CWA by all subcontractors. The Council shall monitor compliance with this CWA of its member organizations.

8.2 The Project Contractor agrees that neither it nor any of its contractors or subcontractors will subcontract any Covered Work to be done on the Project except to a person, firm or corporation who is or agrees to become party to this Agreement. Any contractor or subcontractor working on the Project shall, as a condition to working on said Project, become signatory to and perform all work under the terms of this Agreement.

8.3 Audit rights contained in any collective bargaining agreement with the affected signatory labor organization that predominantly covers work associated with this CWA, shall be limited to the audit of the Contractor's or subcontractor's payroll records for non-exempt personnel assigned to this Project only.

ARTICLE 9 MANAGEMENT RIGHTS

9.1 The Contractor and the Contractor's subcontractors shall have full authority to manage their business operations, including but not limited to the authority to determine the number of workers and craft supervisory personnel, and their qualifications. The Contractor and its subcontractors also shall have full authority to direct the work force, hire, promote, transfer, lay-off, discipline or discharge for just cause, select foremen and general foremen, assign and schedule work, including overtime work and determine when it will be worked and the number and identity of employees to be engaged in such work. Project work rules are subject to the review by the Project Administrative Committee (hereinafter, the "PAC") as described in [Article 12](#).

9.2 There shall be no limitation or restriction on the Owner's, Contractor's or subcontractor's choice of materials or design; or, regardless of source or location, on the full use, installation and utilization of equipment, machinery, package units, pre-casts, prefabricated, pre-finished, or pre-assembled materials, tools, or other labor-saving device. However, when subcontracting for prefabrication of materials for field installation on the Project, such prefabrication shall be subcontracted to fabricators who pay their employees engaged in such fabrication not less than the appropriate Alaska prevailing wage for comparable fabrication, as set by Alaska Statute Title 36, Public Contracts.

9.3 The on-site installation or application of such items shall be performed by employees represented by members of the Council, or labor organizations signatory to this CWA, if such employees traditionally perform such work; provided that other personnel having special talents or qualifications may participate in the installation, check-off or testing of specialized or unusual equipment.

If there is any disagreement between the Contractor, a subcontractor and the Council or a labor organization signatory to this CWA concerning the manner of installation, check-off or testing of such equipment, the work shall proceed as directed by the Contractor, or subcontractor and the labor organization shall have the right to dispute the matter and have it resolved in accordance with Article 21 of this CWA.

9.4 The rights of management enumerated in this Article are limited only by the Contract and the terms of this CWA.

9.5 If all crafts involved agree prior to commencing the work, the Contractor or Sub-Contractor may develop a composite crew for the performance of a particular task. So long as the crew consists of the required crafts in such proportions as the respective work being performed, the traditional craft jurisdictional boundaries will be waived by all Signatory Labor Organizations.

ARTICLE 10 REPRESENTATION OF EMPLOYEES

10.1 The Owner, Contractor and all subcontractors agree to recognize the Council and the labor organizations signatory to this CWA as the sole and exclusive bargaining representatives of all employees performing Covered Work on the Project with respect to wages or rates of pay, benefits, hours of work and other terms and conditions of employment.

10.2 Each labor organization signatory to this CWA shall be entitled to designate one (1) official representative and one (1) official alternate (hereinafter, "Employee Representatives") as primary points of contact. It is understood that, depending upon the availability of these individuals, or the unique nature of a problem or dispute, other Employee Representatives may be designated on a short-term basis. Written notice of the designation of Employee Representatives (Attachment 3) shall be provided to the appropriate Contractor or subcontractor. Employee Representatives shall fully comply with the visitor, safety and security rules established for the Project.

10.3 The Contractor and/or subcontractors shall provide the Council or the appropriate labor organization with written notification of its chain of command for resolving issues or workplace disputes.

10.4 Employee Representatives shall be given fair and reasonable access to the Work Site. Employees performing Covered Work shall be permitted to consult and confer privately with their Employee Representatives. Employee Representatives shall work cooperatively with the Contractor's or subcontractor's representatives to prevent the escalation of Work Site problems and to resolve them at the lowest possible level.

10.5 Each labor organization signatory to this CWA also shall have the right to designate at least one (1) working journeyman as Steward. Written notice of the designation shall be provided to the appropriate Contractor or subcontractor. The Steward shall be recognized as the labor organization's Work Site employee representative. One (1) Steward also may be designated for each shift, should multiple shifts be utilized. Stewards shall be permitted on the Work Site at all times. A Steward's activities may not unreasonably interfere with the Steward's work for the Contractor or its subcontractors, or the work of other employees.

10.6 All Stewards shall be qualified workers assigned to a crew. Under no circumstances shall there be a non-working Steward on the Project.

10.7 The Steward shall be paid at the applicable prevailing wage rate for the job classification in which he or she is employed. The Steward shall be given all rights specified in the specific labor organization's CBA that covers construction work.

10.8 The Contractor shall notify the appropriate labor organization in reasonable advance of disciplining or discharging a Steward for just cause and as soon as possible after it becomes known to the Contractor that a Steward has voluntarily quit. In the case of a bona fide reduction in force, forty-eight (48) hours prior written notice shall be given the appropriate labor organization prior to the lay-off of a Steward. The Steward shall be laid off last in his classification and shall not be subjected to discrimination or discharge on account of providing employee representation.

10.9 No worker shall be required to become a member of a Union, or pay any dues or dues equivalent, to be eligible for employment under this SCWA. If elected by the employee, the Employer and subcontractors will deduct working membership dues, assessments and non-membership fees in the amount designated by the applicable labor organization, provided the employee has executed and provided the Contractor or subcontractor with a written assignment authorizing the deduction. All workers covered by this CWA who are Union members and working for a Contractor signatory to a collective bargaining agreement other than this CWA, shall remain members in said Union during the project. It is understood and agreed that the Contractor or subcontractor assumes no liability in connection with dues or fee collection, except for ordinary diligence and care in transmittal of the monies to the appropriate labor organization. The Contractor or subcontractor will remit to the appropriate labor organization, the dues deducted on or before the fifteenth (15th) day of each month following the month of accrual.

ARTICLE 11 PRE-JOB COOPERATION

11.1 The Contractor, all known subcontractors of all tiers, and the Council shall participate in a Pre-Job conference to be held within thirty (30) days after the award date, but not later than two (2) weeks prior to the commencement of Covered Work, and on an as needed basis for projects with multiple phases or start dates. Once the remaining subcontractors are selected, they shall participate in a Pre-Job conference with the Contractor and affected signatory labor organization(s) prior to starting their work.

11.2 The Pre-Job conference shall be arranged by the CWA Administrator pursuant to Article 12. Information about the scope of work and specific and detailed craft assignments will be presented by the Contractor or subcontractor so that all Parties can review proposed work assignments prior to the start of construction. The Contractor and subcontractors shall present all information available regarding the start date and duration of the Project, estimated peak employment periods, and any other information necessary to help ensure a successful, dispute-free Project.

11.3 Each Subcontractor shall submit a Pre-Job package addressing the matters described in Sections 11.2 and 11.4, to the Contractor for distribution to the Council in reasonable advance of the Pre-Job conference. The Pre-Job package shall include the signed Letter of Assent (Attachment 1), and if applicable, a Core Employee list (Attachment 2) together with supporting documentation pursuant to Article 14.6.

11.4 If the Contractor or any subcontractors at any tier fails to attend the Pre-Job conference prior to the commencement of Covered Work, or to submit the required materials, it shall be considered a violation of this CWA. The Council or signatory labor organization shall immediately notify the Contractor or Owner, as appropriate, of the violation. The Owner shall require the Contractor or subcontractor to take corrective action regarding this matter immediately. No Party shall commence Covered Work until the obligations set forth in this Article are satisfied. If the Contractor is the offending Party, the matter will be resolved by the PAC pursuant to Article 12, upon submission of a written complaint (Attachment 4) to the CWA Administrator.

ARTICLE 12 PROJECT ADMINISTRATIVE COMMITTEE (PAC)

12.1 The parties to this CWA recognize the necessity of cooperation, the prevention and elimination of disputes, misunderstandings, or unfair practices on the part of any party that may arise after award of the Contract or subcontract, or during construction of the Project.

12.2 A Project Administrative Committee (PAC) shall be established consisting of regular members, as follows:

- a. One (1) Contractor representative who shall be appointed by the Contractor and who shall have the authority to speak for and make decisions on the Contractor's behalf

Contractor Representative shall be: _____

- b. The President of the Council shall preside as the PAC Representative and have the authority to speak for and make decisions on behalf of the Council after consultation with the appropriate signatory labor organization(s) as necessary.

Council Representative shall be: _____

- c. One (1) CWA Administrator representing the Owner who shall be appointed by the Owner and who shall have the authority to make decisions on the Owner's behalf. The Owner through the CWA Administrator, or Designee, shall initiate and participate in all proceedings of the PAC. The CWA Administrator or Designee shall chair all meetings of the PAC.

CWA Administrator shall be: _____

12.3 The PAC shall monitor the progress of the project and be empowered to address Project wide issues and disputes such as, Project policies and work rules; Project safety; compliance with hiring requirements, apprenticeship utilization; job progress; job interruptions; core employee hire and other significant issues as may affect the Project. Furthermore, the PAC shall track the implementation of apprenticeship, military, and other hiring preferences and report progress to the Owner. The PAC's dispute resolution process does not supersede, nor is it a substitute for the grievance process. Complaints involving alleged violations of this CWA, or any signatory labor organization's CBA that predominantly covers their work associated with this CWA shall be resolved in accordance with the grievance process set forth in Article 20.

12.4 A Party or Parties may submit a dispute to the PAC for resolution, by providing a written copy of the Party's complaint (Attachment 4) to the CWA Administrator and all affected Parties. The CWA Administrator shall call a meeting to address any such complaint promptly upon receipt of it. One (1) representative of the Contractor, one (1) representative of each subcontractor(s) involved in the complaint, one (1) representative of the Council, and one (1) representative of each labor organization(s) involved in the complaint will be permitted to attend and participate in the complaint's resolution. Affected parties will be given an opportunity to present facts and witness testimony relevant to the complaint in accordance with general standards of due process. Proceedings of the PAC shall be informal and strict application of the rules of evidence shall not be required. If resolution of the complaint by mutual agreement of the Parties is not possible, the PAC shall decide the matter by open ballot, majority vote.

12.5 No decision or resolution reached by the PAC shall supersede, alter, modify, amend, add to or subtract from this CWA, or any signatory labor organization's CBAs except as the latter is modified or superseded by this CWA. The PAC's resolution of a complaint shall be reduced to writing and shall be signed by all the Parties. Decisions of the PAC shall be final and shall not be subject to appeal.

12.6 The PAC shall meet as needed to review the overall operation of the CWA on the Project. In the case of emergencies, the PAC shall be convened by the CWA Administrator, within forty-eight (48) hours of a written request submitted by any Party. All Parties acknowledge the importance of attendance and active support of the PAC and shall participate in meetings of the PAC as one of their responsibilities on the Project.

12.7 To promote day to day Work Site continuity, cooperation and information exchange, the Contractor and Council shall have Labor Management meetings monthly. The Contractor may also require the participation of any/all subcontractors who are working, or soon to be working on the Project. At these monthly Labor Management meetings, the topics of discussion will include job status, schedule updates, future work assignments, letter of assents, worker needs, and any other issue or concern that will help achieve a harmonious work site.

ARTICLE 13 CONTINUITY OF OPERATIONS

13.1 During the term of this CWA there shall be no strikes, picketing, work stoppages, slowdowns, or other disruptive activity for any reason by the Council, its signatory labor organizations, or by any employee employed on the Project.

13.2 There shall be no lockout of employees by the Contractor or subcontractors. In the event of action in violation of this Article, the Contractor may suspend all or any affected portion of the Work.

13.3 Any employee who participates in or encourages behavior that interferes with the performance of Covered Work may be subject to disciplinary action, up to and including discharge.

ARTICLE 14 HIRING PROCEDURES

14.1 The Contractor and subcontractors agree to comply with and exclusively use the appropriate signatory labor organization's referral system. All referral systems will be operated by the signatory labor organizations in a nondiscriminatory manner, in full compliance with federal, state, and local laws. Registration on out of work lists, or job referrals shall not be affected positively or negatively by membership or non-membership

in a labor organization and shall be open to all those who meet the respective crafts requirements.

14.2 By Contractor or subcontractor request, the appropriate signatory labor organization shall, to the greatest extent possible, prioritize the dispatch of applicants who are residents of the communities surrounding Project Work Sites. At the request of the Contractor or subcontractor, the appropriate signatory labor organization also shall, to the greatest extent possible, prioritize the dispatch of applicants falling within the focus categories set forth in the Preamble.

14.3 The Contractor may reject any applicant referred by a signatory labor organization for any lawful, nondiscriminatory reason, in accordance with the applicable labor organization's hiring hall rules and regulations. A written explanation shall be provided to the affected labor organization within forty-eight (48) hours of the rejection.

14.4 In the event any signatory labor organizations are unable to fill a request for referrals within forty-eight (48) hours after the request is made by the Contractor or a subcontractor (except for Saturdays, Sundays, and holidays), the Contractor or subcontractor may employ applicants from any other available source. The Contractor or subcontractor shall provide the appropriate labor organization with the name, address and phone number, or other viable contact information, in writing, for every applicant hired from other sources, and shall refer such applicants to the appropriate labor organization for dispatch to the Project before such applicant begins working on the Project. All successful applicants, whether referred by a signatory labor organization, or by another source, shall satisfy their financial obligations in accordance with the signatory labor organization hiring hall rules.

14.5 To ensure that the Contractor and all subcontractors have an opportunity to employ ("Core") employees on the Project, the Parties agree that in those situations where the successful Contractor or subcontractor is not a party to a current collective bargaining agreement with the affected signatory labor organization, the Contractor, or subcontractor, may request by name Core employees in accordance with the affected signatory labor organization's hiring hall rules. At the time of signing the letter of assent a list of all Core employees and classifications must be submitted (Attachment 2). All subsequent referrals will be made by the labor organization's hiring hall.

14.6 In order to be eligible to request a Core employee by name, the Contractor first must, demonstrate that the person possesses the following qualifications. Applicants, who cannot satisfy the following qualifications, will not be eligible for dispatch as Core employees:

- a. Holds all licenses required by state or federal law for the Covered Work to be performed.
- b. Has worked a total of at least one thousand (1,000) hours in the construction craft performing the Covered Work to be performed, during the previous year.

- c. Has the ability to safely perform the essential functions of the job.

14.7 Complaints that the Core employee provisions of this Article have been violated shall be submitted in writing to the CWA Administrator and resolved by the PAC on an expedited basis. Any Contractor or subcontractors that attempt to or that are found to have circumvented the Core employee hiring provisions of this Article by misclassifying any of its employees as supervisors or foremen, or in any other way, shall, by Order of the PAC, forfeit their right to employ Core employees for the remaining duration of the Project.

ARTICLE 15 APPRENTICESHIP AND TRAINING

15.1 The Parties recognize the need for meaningful, continuing support of bona fide apprenticeship programs. Such programs enable community members and District graduates to enter the labor market qualified to earn a family wage on a construction job. They ensure that a diverse, well-trained workforce essential to the economic and social vitality of Alaska and in particular, the communities surrounding the Work Site, is cultivated on an ongoing basis. The signatory labor organizations agree to support and to enhance existing apprenticeship programs to provide training and job opportunities to District graduates, young people, and unskilled adults. The Contractors will employ apprentices to perform work customarily performed by the craft in which they are registered, within the capability of the apprentice.

15.2 Apprentices shall be utilized in accordance with the signatory labor organization's CBAs that predominantly covers the work associated with this CWA. Apprentices shall be indentured in bona fide training programs approved by the United States Department of Labor, Office of Apprenticeship Training, Employer Labor Services (formerly the Bureau of Apprenticeship & Training).

15.3 Consistent with Board Policy 3311.1.2 (Use of Apprentices), the Contractor shall ensure that no less than fifteen (15%) percent of the total Contract labor hours worked on the Project are worked by registered Apprentices.

15.4 The Contractor and each subcontractor shall estimate the total contract labor hours to be worked on the construction contract awarded to it and shall establish the anticipated apprenticeship participation by craft and hours. The Contractor shall submit a monthly report for itself and all subcontractors to the CWA Administrator identifying the number of apprentices and journey workers used by craft and trade at each tier and level of work. The CWA Administrator shall determine whether the Contractor or subcontractor is in compliance with the provisions of this Article and collaborate with Sr. Director of Purchasing-Warehouse on management of the District's Apprenticeship Utilization Program.

15.5 Funding for Apprenticeship and training shall be through hourly contributions to each respective Union's Joint Apprenticeship Training Committee (JATC) programs. Those contributions shall be in accordance with the appropriate Signatory Labor Organization's Schedule "A".

ARTICLE 16

DISTRICT GRADUATES AND PREFERRED ENTRY APPRENTICESHIP

16.1 The Parties are committed to expanding employment and training opportunities for District graduates and providing additional work opportunities for District graduates and students in career and technical education to the full extent permitted by law.

16.2 The Parties agree to construct and expand pathways to livable wage jobs and careers in the construction industry for community residents and District graduates through collaborative workforce development systems and bona fide apprenticeship programs maintained by the Council and its member organizations.

16.3 To the extent permitted by law and current Anchorage School Board policy regarding employment of sex offenders, preferred Entry programs will be utilized in an attempt to identify qualified individuals such as: District graduates, youth, unskilled adults, military veterans, members of the National Guard or reservists, people of color, women, socially/economically or otherwise disadvantaged members of the community, or individuals facing reentry after a period of State of Alaska incarceration, for preferred entrance into the regular apprenticeship programs maintained that have been or will be created by the labor organizations signatory to this CWA.

16.4 Identification, selection and mentorship of qualified applicants to be accepted into apprenticeship programs will be the sole responsibility of the Joint Apprenticeship Training Committee (JATC) of each bona fide Apprenticeship and Training program.

ARTICLE 17

MILITARY VETERANS, MEMBERS OF THE NATIONAL GUARD, AND RESERVISTS

17.1 The Contractor, subcontractors, the Council, and its member organizations have committed to facilitating entry into the building and construction trades of veterans, members of the National Guard and reservists who are interested in careers in the building and construction industry. The Contractors and Unions agree to utilize the services of the Center for Military Recruitment, Assessment and Veterans Employment (hereinafter "Center") and the Center's "Helmets to Hardhats" program and other appropriate veteran's programs. In furtherance of these efforts, the primary program to serve as a resource for preliminary orientation, assessment of construction aptitude, referral to apprenticeship programs or hiring halls, counseling and mentoring, and other needs identified by the Parties shall be VIPER.

17.2 The Contractor, subcontractors, and the labor organizations signatory to this CWA agree to coordinate with the Center and other appropriate veteran referral sources, to create and maintain an integrated database of veterans interested in working on the Project.

17.3 The labor organizations signatory to this CWA shall to the extent permitted by law, make reasonable, appropriate adjustments to their hiring hall rules and regulations to give credit to military veterans, members of the National Guard and reservists, for bona fide, provable past work experience.

ARTICLE 18 SOCIO-ECONOMICALLY DISADVANTAGED COMMUNITY MEMBERS

18.1 To the extent permitted by law and current Anchorage School Board policy regarding employment of sex offenders, employment opportunities shall be provided to eligible at-risk individuals, such as youth, unskilled adults, people of color, women, and those who experience a barrier to gaining employment due to their personal backgrounds. Those may include, socio-economically disadvantaged members of the community and individuals facing reentry into the community after leaving a State of Alaska correctional facility or incarceration.

ARTICLE 19 DRUG AND ALCOHOL-FREE WORKPLACE

19.1 The Contractor shall implement a fair and equitably administrated Drug Free Workplace Policy and Program (hereinafter, the "Policy") for the duration of this CWA. The Policy will be administered in accordance with the provisions of its ALCOHOL AND DRUG POLICY which shall be included as an Exhibit 1 to this CWA. All positive or inconclusive drug or failed alcohol results must be verified by an independent third-party agency approved in advance by the CWA Administrator. The CWA Administrator has the right and authority to conduct an audit of the administration of the drug and alcohol testing procedures being implemented by the Contractor, upon request of any Party to this CWA.

19.2 Consistent with the Owner's goals as forth in this CWA, persons with a history of alcohol or drug abuse shall not be denied employment on the Project so long as they can demonstrate their present ability to satisfy the requirements of the Drug Free Workplace Policy and Program applicable to the Project.

ARTICLE 20 STANDARDIZED GRIEVANCE PROCEDURE

20.1 This CWA is intended to provide close cooperation between labor and management, the Contractor, subcontractors, and signatory labor organizations with respect to the day-to-day performance of Covered Work. Alleged violations of this CWA or any signatory labor organizations CBA that predominantly covers work associated with this CWA, governing the performance of Covered Work by employees represented by a signatory labor organization, shall be resolved as follows.

- a. **Step 1.** When any employee subject to the provisions of this CWA feels he or she has been adversely affected by a violation of this CWA or any signatory labor organizations CBA that predominantly covers work associated with this CWA, they shall, through their local Business Representative or job steward, give notice to the appropriate Contractor or subcontractor representative of the grievance. Notice shall be given within seven (7) calendar days after the employee become or should have become aware of the violation. The labor organization's representative or job steward and the Contractor's representative shall meet and endeavor to adjust the matter within three (3) calendar days after timely notice has been given. The representative of the Contractor shall respond to the Business Representative in writing at the conclusion of the meeting but not later than two (2) calendar days thereafter. If the Party's representatives fail to resolve the matter within the prescribed period, the grieving party may, within two (2) calendar days thereafter, pursue Step 2 of the Grievance Procedure, provided the grievance is reduced to writing, setting forth all relevant information, including a short description of the grievance the date on which the grievance occurred, and the provision(s) of the CWA alleged to have been violated.
- b. Should a Party have a dispute with another Party they shall meet promptly to resolve it. If a settlement is not reached within three (3) calendar days of the meeting, the dispute may be reduced to writing and submitted at Step 2, in the same manner as outlined for the adjustment of an employee grievance.
- c. **Step 2.** The Business Representative of the signatory labor organization or designee and the Contractor or subcontractor's representative, or designees shall meet within seven (7) calendar days after referral of a dispute to Step 2, to arrive at a satisfactory settlement. If the Parties' representatives fail to reach an agreement, the dispute may be appealed in writing in accordance with the provisions of Step 3 within seven (7) calendar days thereafter.
- d. **Step 3.** If the grievance has been submitted but not adjusted at Step 2, either Party may within seven (7) calendar days thereafter, request in writing, that the grievance be submitted to a mutually acceptable Arbitrator. Alaskan arbitrators shall be utilized to the greatest extent possible. If an Arbitrator cannot be selected by mutual agreement, the selection shall be made by the PAC. The decision of the Arbitrator shall be final and binding on all Parties. The fee and expenses of Arbitration shall be borne equally by the Contractor or subcontractor and the labor organizations involved in the grievance regardless of the outcome.

- e. Failure of a Party to adhere to the time limits established herein shall be deemed a default and shall resolve the grievance in favor of the non-defaulting party. The time limits established herein may be extended only by written consent of the Parties involved. The Arbitrator shall have the authority to make decisions only on the issues presented, and shall not have authority to change, amend, add to or detract from any of the provisions of this CWA, or any signatory labor organizations CBA that predominantly covers work associated with this CWA.

ARTICLE 21 CRAFT JURISDICTION & JURISDICTIONAL DISPUTES

21.1 The assignment of work is the sole responsibility of the Contractor performing the work involved; such work assignments will be under the Plan for the Settlement of Jurisdictional Disputes in the Construction Industry (the "Plan") or any successor Plan.

21.2 If there is a dispute over a work assignment on the Project, between or among signatory labor organizations and Contractors of any tier, representatives of the signatory labor organizations claiming the work shall first meet with the Council President, or designee, who will attempt to mediate a resolution on an expedited basis. If a resolution to the dispute cannot be reached, the signatory labor organizations claiming the work then shall notify the CWA Administrator and the dispute shall be settled and adjusted according to the Plan. Decisions rendered shall be final, binding, and conclusive on the Contractors and labor organizations that are parties to this Agreement.

21.3 All jurisdictional disputes shall be resolved without strike, work stoppage, or slow-down of any nature and the Contractor's assignment shall be adhered to until the dispute is resolved. Individuals violating this section may be subject to discipline up to and including discharge for just cause.

ARTICLE 22 WORK RULES

22.1 The Owner or the Contractor(s) may establish reasonable Project Rules, so long as such Rules are not inconsistent with this CWA. Project Rules will be explained at the pre-job conference and posted at the Project Site by the Contractor or appropriate subcontractor. Failure by any employee to observe these rules and regulations may be grounds for discipline, up to and including discharge for just cause.

22.2 Security procedures for control of tools, equipment and materials are solely the responsibility of the Contractor and its subcontractors. Employees having any company property or property of another employee in their possession without authorization may be subject to discipline, up to and including discharge for just cause. The Contractor or

subcontractor will be responsible for the establishment of reasonable job security measures for the protection of personal company and client property on the Work Site.

ARTICLE 23 SAFETY, HEALTH AND SANITATION

23.1 Employees shall be provided with a safe, drug and alcohol-free environment in which to work. All employees performing Covered Work on the Project shall be covered by a properly classified Alaska Workers' Compensation Policy. All required safety equipment shall be provided by the Contractor or subcontractors at no cost to employees.

23.2 The Contractor, subcontractors and employees performing Covered Work on the Project shall comply with all applicable provisions of District, local, state and federal laws, rules and regulations, relating to job safety and safe work practices (hereinafter, "Safety Rules"). Safety meetings will be scheduled and conducted weekly by the Contractor or subcontractor as appropriate, to discuss safety on the Project and to ensure adequate awareness and understanding of the manner of implementation and the application of all Safety Rules.

23.3 All employees shall be required to use appropriate, personal, protective equipment as is or may be prescribed by state or federal safety and health standards or by the Contractor. Adequate training shall be provided to all Project employees to ensure proper utilization of such equipment. Failure of employees to use such equipment properly may be grounds for disciplinary action, up to and including dismissal.

23.4 No employee shall be required to work under conditions or circumstances which place the employee in imminent danger of physical harm or injury, except that the employee may not make any such claim or refuse to perform Covered Work as a pretext for refusing to carry out a work assignment.

23.5 The Contractor or subcontractor may shut down a job, or a portion thereof, if in the Contractor's or subcontractor's judgment, an emergency arises which could endanger the life and safety of an employee. In such cases, employees will be compensated only for the actual time worked or for standby time if standby is required by the Contractor or subcontractor.

23.6 The Contractor and its subcontractors, as appropriate, shall provide a convenient and sanitary supply of drinking water and sanitary drinking cups, adequate sanitary toilet and clean up facilities for the employees, and dry racks sufficient to accommodate employees during rest and meal breaks, and for storage of employee's personal clothing and equipment.

23.7 Where an unsafe condition is alleged to exist, the affected employee shall first notify his or her immediate supervisor who shall take any necessary corrective action. If the employee's immediate supervisor is not available, the employee may satisfy his or her duty to report unsafe conditions promptly, by notifying any available Shop Steward or

management representative of the Contractor or subcontractor. If the parties fail to resolve any difference or disagreement over the existence of an unsafe condition or the appropriate corrective measures to be taken, the issue shall be referred immediately, for final and binding, resolution to the CWA Administrator and resolved by the PAC pursuant to Article 12.

ARTICLE 24 PROTECTION OF PERSON AND PROPERTY

24.1 Employees shall use diligent care to perform their work in a safe manner and to protect themselves, the environment, and the property of the Employer. Failure to do so may, depending upon the severity of the offense, result in discipline up to and including dismissal. The Employer shall establish, post, and ensure employees are aware of and understand, reasonable visitor, security, and safety rules necessary to achieve this objective.

ARTICLE 25 WAGE SCALES AND FRINGE BENEFITS

25.1 All employees covered by this Agreement shall be classified in accordance with Alaska Statute Title 36, Public Contracts. This shall be applicable to all Contractors and subcontractors.

25.2 Wages and benefits for referenced project shall remain at the levels specified in the specific contract documents for twenty-four (24) months from the award date. After twenty-four (24) months, the wage and benefit will increase to the current prevailed rate as published by the Alaska State Statute Title 36.

25.3 The Contractor and all Sub-Contractors shall be required to pay into an appropriate joint labor/management employee benefit trust(s) ("Trust Fund") unless alternative benefit plans are approved by each affected Signatory Labor Organization as outlined Section 25.4 below. Contractor and subcontractors shall be required to complete trust documents and submit them to the Trust Fund for each employee and to pay into the Trust Fund as required by that Trust Fund's schedule.

25.4 **Alternative Benefits.** The Parties recognize the Owner's commitment to provide opportunities on the Project for all Contractors and subcontractors, including those which may not have previously had a relationship with the labor organizations signatory to this CWA. Each labor organization signatory to this CWA agrees to meet and confer with the Contractor or subcontractor to discuss alternative benefits for Pension and/or Health and Welfare to meet the needs of their core employees as defined in Article 15 above. To be eligible, Contractors or subcontractor's must have a qualifying Pension and/or Health and Welfare plan currently covering their core employees as outlined below. If such

Contractors or subcontractors do not have a qualifying company Pension and/or Health and Welfare plan, they shall be required to contribute to the appropriate Trust Fund for their core employees. All Contractors and subcontractors are required to pay the prevailed amount into the Training Trust Funds for the appropriate Signatory Labor Organization.

Qualifying Pension and/or Health and Welfare plan shall be one that satisfies the following requirements:

- a. The Contractor's or subcontractor's company Pension and/or Health and Welfare plan must have been in existence for a period of at least one (1) year prior to the Contractor's or subcontractor's bid or proposal submission for work on the Project; and
- b. The employees for whom continued coverage under the Contractor's or subcontractor's plan will be maintained must be qualified core employees as defined above and have been participants in such plans for the six (6) month period prior to their employment on the Project.

If the above requirements are met, the Contractor or subcontractor may request to meet and confer by submitting a written request to the Administrator for each affected signatory labor organization using (Attachment 5).

25.5 If any Contractor or subcontractor does not pay into the appropriate Trust Fund, the affected labor organization's trust administrator shall provide written notice to the Contractor.

- a. The delinquent subcontractor, and the Contractor by mutual agreement, may identify other agreeable solutions that will assure timely payment to the Trust Fund. If the delinquent amounts are undisputed in whole or in part between the Trust Fund and the delinquent subcontractor, the Contractor shall issue a joint check to the Trust Fund and the subcontractor, in the amount of the undisputed delinquency.

25.6 If the Contractor is the delinquent Party, written notice of the alleged delinquency shall be provided by the affected labor organization to the CWA Administrator, and the delinquency shall be resolved by the PAC pursuant to Article 12.

25.7 Copies of applicable Trust Agreements will be made available upon request of the Contractor or subcontractor.

ARTICLE 26 WORK HOURS AND PAY

26.1 Workweek and Workday.

- a. **Regular Workweek and Workday.** The regular workweek shall be five (5) consecutive days falling within Monday through Saturday. Where a single shift is worked, the regular workday shall be eight (8) consecutive hours between 6:00 AM and 6:00 PM; exclusive of a meal period of not less than one-half (1/2) hour. Nothing herein shall preclude the Contractor or subcontractor from scheduling any workday in excess of eight (8) hours or a workweek in excess of forty (40) hours. The Contractor or subcontractor shall determine and establish the work starting times at any time between 6:00 AM and 8:00 AM. All work performed before the regular starting time or after eight (8) consecutive hours shall be paid at the regular overtime rate, except that under conditions beyond the control of the parties to this Agreement (such as concrete paving, concrete pouring, asphalt paving, and road oiling work), or on work requiring special crews, or when the job or weather conditions warrant, the work starting time shall be mutually arranged to fit such conditions without penalty or premium payment. Other starting times, including staggering starting times, may be mutually agreed upon by the Parties without premium pay.
 - b. **Four-Ten Hour Workweek (4-10's).** With notification to the employees prior to the end of their workweek, the Contractor or subcontractor may schedule a workweek of four (4) consecutive ten (10) hour workdays between Monday and Saturday within the standard starting times as stated in Section 26.1 at the straight time rate of pay. Any work in excess of ten (10) hours on scheduled workdays shall be paid at the overtime rate of pay, and overtime shall be paid for any hours in excess of forty (40) in any workweek.
 - c. **Assembly Point.** The time of each Employee shall start in the morning at the designated Assembly Point, which shall be agreed upon at the pre-job conference. The Contractor or subcontractor shall make suitable and prompt transportation available from Assembly point to the job site and back. The time of the Employees shall end at quitting time on the job sites. It is intended that the lapse of time used to transport the Employees from normal quitting time at the job site to Assembly Point shall not exceed the lapse of time from starting time at Assembly Point in the morning to the Job site. In the event that the cumulative round-trip travel exceeds one (1) hour, then the employee's time exceeding the one (1) hour will be considered as time worked and compensation will be computed at the applicable rate. The Contractor or subcontractor will utilize Teamsters for all hours worked hauling employees to and from the agreed upon assembly point.
- 26.2 **Meal Period.** The Contractor or subcontractor will schedule a meal period of not less than one-half (1/2) hour, or more than one (1) hour's duration at approximately the mid-point of the scheduled shift regardless of such shift duration (8, 10, or 12 hours). The Contractor or subcontractor shall make an earnest effort not to work employees six (6) hours without a meal period. If the Contractor or subcontractor finds it is necessary to work employees beyond six (6) hours without a meal period, the employees shall be allowed a later meal period, and it shall be considered time worked and paid for at the proper overtime rate.

26.3 Overtime.

- a. All work performed in excess of eight (8) consecutive hours (excess of ten (10) hours on a four-ten (4-10) schedule) in any one (1) day or forty (40) hours in any one (1) workweek shall be paid at one and one-half (1-1/2) times the straight time rate of pay. Employees shall be paid in accordance with the appropriate signatory labor organizations CBA that predominantly covers work associated with this CWA for all work performed on Saturdays and Sundays. An employee who was absent on their own accord, but work was made available during a regular straight time day, may be compensated at the straight time rate for hours worked on Saturday.
- b. When a shift is started at a basic rate or at the appropriate overtime rate applicable on that day, it shall be completed at that rate. There will be no restrictions upon the Employer's scheduling of overtime or the non-discriminatory designation of employees that shall be worked. There will be no pyramiding of overtime.

26.4 Holidays.

- a. All Holidays, except for Labor Day, may be worked. No work may be performed or scheduled on Labor Day unless an emergency exists.
- b. If Saturday is not a normally scheduled workday, the holiday shall be observed on the preceding Friday. If Sunday is not a normally scheduled workday, the holiday shall be observed on the following Monday.
- c. Employees shall be paid in accordance with the appropriate signatory labor organizations CBA that predominantly covers work associated with this CWA for all work performed on recognized holidays.
- d. Recognized Holidays shall be:
 - New Year's Day (January 1st)
 - Presidents' Day (Third Monday of February)
 - Memorial Day (Last Monday in May)
 - Independence Day (July 4th)
 - Labor Day (First Monday of September)
 - Veteran's Day (November 11th)
 - Thanksgiving Day
 - Christmas Day (December 25th)

26.5 Shift Work.

- a. Shift work may be performed at the option of the Contractor or subcontractor. The Contractor or subcontractor shall have the sole right to establish the starting time and duration of a shift, to designate the craft or crafts performing work on a shift

basis on the Project or any portion thereof, and to determine the number of employees required. Any time worked more than the regular shift shall be paid for at the normal overtime rate. The meal period provisions of Section 26.2 of this Article shall apply to both shifts.

- b. On two- or three-shift operations, the work starting time for the first shift will not be established earlier than 5:00 AM, unless an earlier starting time is mutually agreed upon. If an earlier starting time is established without such mutual consent, overtime for those hours earlier than 5:00 AM will be paid. When an employee is moved from one shift to another, they shall be allowed a minimum of eight (8) consecutive hours off duty before they are required to begin work on the shift. An employee not having an eight (8) hour break between shifts shall be paid the overtime rate until such time as they receive an eight (8) hour break.
- c. When changing shifts, the employee must be permitted to remain on that shift for at least fourteen (14) calendar days, unless this requirement is waived in writing by the employee's Employee Representative.
- d. Employees shall be at their place of work at the starting time and shall remain at their place of work performing their assigned functions under the supervision of the Contractor or subcontractor until quitting time. The parties reaffirm their policy of a fair day's work for a fair day's wage.
- e. Scheduling and premium pay for two- or three-shift operations shall be in accordance with the appropriate Signatory Labor Organization's Schedule "A".
- f. When two (2) or three (3) shifts are regularly established and the first or second shift cannot be worked due to conditions caused by weather, either shift may be worked in accordance with the applicable Signatory Labor Organization's Schedule "A".

26.6 Reporting Pay.

- a. If an employee reports to work for a regular or assigned shift and, weather permitting, is not put to work, he or she shall be paid two (2) hours reporting time and shall remain at the job site for two (2) hours if required by the Contractor or subcontractor.
- b. An employee who starts to work shall be paid for not less than two (2) hours, and if the employee works beyond two (2) hours, the employee shall be paid for actual time worked. It shall be the Contractor or subcontractor's prerogative whether or not to stop work.
- c. No employee covered by this Agreement shall be called to work outside of their regular shift for less than two (2) hours paid for such work at the applicable rate.

- d. Any employee who leaves the job or work location of his or her own volition, quits, or is discharged for cause, shall be paid only for the time worked.

26.7 Payday.

- a. Wages will be paid weekly by check or direct deposit on a designated day during working hours and, in no case, shall more than five (5) days be held back in any one (1) payroll week. Each payday the Employee shall be given a check or stub and a statement showing hours, deductions, and hourly rates of pay, with the Contractor or subcontractor name and address clearly stated.
- b. When an employee is separated from employment, wages become due within three (3) days after separation (excluding weekends and holidays). Where complete payroll information is not available and the check issued is less than the total amount due, a check for the balance shall be sent to the office of the appropriate signatory labor organization. Should the Contractor or subcontractor fail to comply with this provision, in whole or part, the employee will be entitled to eight (8) hours pay at the straight time rate of pay for each day full termination pay is delayed (excluding Saturdays, Sundays and holidays). Checks not picked up by the employee shall be delivered to the appropriate signatory labor organization.

26.8 Travel and Subsistence. There shall be no travel, daily travel, subsistence, or zone pay required under the provisions of this Agreement, but nothing in this Agreement prohibits the Contractor or subcontractor from providing any of the aforementioned items necessary to employ workers and payment of travel and subsistence is encouraged.

26.9 Employee Access. Employee access to the Work Site by private automobile may be limited to certain roads and/or parking areas. Parking at or near the Work Site will be provided to employees at no cost. If such parking cannot be provided, transportation between the parking area and the Work Site shall be provided by the Contractor or subcontractor, and employees will be given fifteen (15) minutes of pay each way, or compensation for actual transportation time, whichever is greater. Parking fees shall be reimbursed if employees are required to park in a private lot.

26.10 Foremen and General Foremen.

- a. The selection of craft foremen and general foremen shall be the exclusive responsibility of the Contractor or subcontractor. Foremen and general foremen shall take directions from authorized Representatives of the Contractor or subcontractor.
- b. Craft foremen may be required to perform covered work of the trade.
- c. General foremen may perform incidental work of the trade.
- d. Craft and general foremen shall be paid at the applicable foreman rate.

- e. The number of craft foremen and general foremen shall be in accordance with the applicable signatory labor organizations CBA that predominantly covers work associated with this CWA.
- f. All foremen shall have the authority and responsibility to terminate for just cause any employee working under their supervision who fails to perform satisfactorily, competently, and diligently his or her assigned duties.

ARTICLE 27 COMPLETE AGREEMENT

27.1 This CWA represents the complete agreement of the Parties. Neither the Contractor nor any subcontractor will be required to sign any other agreement with the Council, or its member labor organizations, as a condition of performing work on the Project. If this CWA is silent on an issue the applicable signatory labor organization's CBA that predominantly covers work associated with this CWA will be used to determine the outcome. Where there is a conflict, the terms of this CWA shall supersede the terms of all national, regional, or signatory labor organizations CBAs that predominantly covers work associated with this CWA, except for all work performed under the NTD Articles of Agreement, the National Stack/Chimney Agreement, the National Cooling Tower Agreement, the National Agreement of the International Union of Elevator Constructors; and all instrument calibration work and loop checking shall be performed under the terms of the UA/IBEW Joint National Agreement for Instrument and Control Systems Technicians; with the exception of Articles 13, 20, and 21 of this Project Agreement, which shall apply to such work. Nothing in this CWA requires employees to join a union or pay dues or fees to a union as a condition of working on the covered project. This CWA is not, however, intended to supersede independent requirements in applicable local union agreements as to contractors that are otherwise signatory to those agreements and as to employees of such employers performing covered work.

27.2 Nothing in this CWA shall modify, amend, or supersede any provisions of any other agreement between the Owner, Contractor, and its subcontractors, or between the Owner, Contractor, its subcontractors and the Council or individual members of the Council.

27.3 The liability of any employer and the liability of the separate unions under this Agreement shall be several and not joint. The unions agree that this Agreement does not have the effect of creating any joint employer status between or among the Owner, Contractor(s) or any employer.

**ARTICLE 28
GENERAL SAVINGS CLAUSE**

28.1 If any article or provision of this Agreement is declared invalid, inoperative, or unenforceable by any administrative agency, or court of competent jurisdiction, the remainder of this CWA shall not be affected thereby. Thereafter, any Party may, upon not less than thirty (30) days written notice to the others, have the right to open negotiations for the substitution of a new article or provision consistent with the decision of the board or court and the intent of the invalidated provision.

ENDORSEMENT

The authorized signature by the undersigned commemorates and affirms the approval of this CWA by all Parties and its adoption as a bid specification for contracts pertaining to all Covered Work on the Project.

FOR THE PARTIES:

By:

Anchorage School District

Date

By:

Contractor

Date

By:

Building and Construction Trades Council of
South Central Alaska - President

Date

Building and Construction Trades Council of South-Central Alaska - Affected trades:

By:

Bricklayers Local 1

Date

(206) 248-2456

By:

Boilermakers Local 502
(253) 435-0330

Date

By:

Cement Masons Local 528
(907) 351-0151

Date

By:

Heat & Frost Insulators Local 7
(206) 812-0777By:

Date

By:

IBEW Local 1547
(907) 272-6571

Date

By:

Ironworkers Local 751
(907) 563-4766

Date

By:

IUOE Local 302
(907) 561-5288

Date

By:

Laborers' Local 341
(907) 341-0341

Date

By:

Western States Regional Council of Carpenters
(907) 276-3533 Date

By:

Painters (IUPAT) Local 1959
(907) 562-8843

Date

By:

Plumbers & Steamfitters UA Local 367
(907) 562-2810

Date

By:

Roofers Local 189
(509) 327-2322

Date

By:

Sheet Metal Workers Local 23
(907) 277-5313

Date

By:

Sprinkler Fitters Local 669
(907) 283-8198

Date

By:

Teamster Local 959
(907) 751-8500

Date

ATTACHMENT 1 - LETTER OF ASSENT
COMMUNITY WORKFORCE AGREEMENT
FOR THE

_____ **PROJECT**

The undersigned, as a Contractor or subcontractor on the _____ Project, for and in consideration of the award of a Contract to perform work on said Project, and in further consideration of the mutual promises made in the Community Workforce Agreement (CWA), a copy of which was received, reviewed, is understood, and acknowledged, hereby:

- a. On behalf of itself and all its employees, accepts and agrees to be bound by the terms and conditions of the CWA, together with any and all amendments and supplements, such as individual signatory labor organization's Schedule A's, now existing or that are later made thereto, and understands that any act of non-compliance with all such terms and conditions, will subject the non-complying Contractor or employee(s) to being prohibited from the Project Site until full compliance is obtained.
- b. Certifies that it has no commitments or agreements that would preclude its full compliance with the terms and conditions of said CWA.
- c. Agrees to secure from any subcontractor, of any tier (as defined in the CWA), a duly executed Letter of Assent in form identical to this document prior to commencement of any Covered Work.

Dated: _____

(Name of Contractor/Company) _____

(Signature of Authorized Representative) _____

(Print Name and Title) _____

(Phone Number) _____

(Billing Address) _____

(City, State and Zip Code) _____

(General Contractor) _____

(Contract Number) _____

ATTACHMENT 2 – CORE EMPLOYEE ROSTER

**COMMUNITY WORKFORCE AGREEMENT
FOR THE**

_____ **PROJECT**

Contractor or subcontractor Name: _____

Per Article 14, and in accordance with the qualifications listed in Section 14.6, the following shall be considered our core employees for this project:

Name	Classification
1) _____	_____
2) _____	_____
3) _____	_____
4) _____	_____
5) _____	_____
6) _____	_____
7) _____	_____
8) _____	_____
9) _____	_____
10) _____	_____

Submitted By:

Contractor/subcontractor

Date

Page _____ of _____

ATTACHMENT 3 – EMPLOYEE REPRESENTATIVES

**COMMUNITY WORKFORCE AGREEMENT
FOR THE**

_____ **PROJECT**

Per Section 10.2, the following are the designated Employee Representatives:

Labor Organization: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Physical Address: _____

City: _____ State: _____ Zip: _____

Primary Representative: _____

Cell Phone: _____ Office Phone: _____

Email Address: _____

Alternate Representative: _____

Cell Phone: _____ Office Phone: _____

Email Address: _____

By:

Signatory Labor Organization

Date

ATTACHMENT 4 – PAC DISPUTE
COMMUNITY WORKFORCE AGREEMENT
FOR THE

_____ **PROJECT**

CWA Administrator: _____

Party/Parties Filing Dispute: _____

Point of Contact: _____ Phone: _____

Date of Occurrence: _____

Statement of Dispute: _____

CWA Articles or sections that Apply: _____

Recommended Remedy: _____

By:

Signatory

Date

ATTACHMENT 5 – ALTERNATIVE BENEFITS REQUEST**COMMUNITY WORKFORCE AGREEMENT
FOR THE****_____ PROJECT**

CWA Administrator: _____ Date: _____

Contractor/subcontractor requesting: _____

Point of Contact: _____ Phone: _____

Signatory Labor Organization Affected: _____

This request to meet and confer about alternative benefit arrangements for core employees shall also include the following:

- 1) A copy of the Contractor's or subContractor's Health and Welfare and/or Pension plan; and
- 2) A list of the core employees who will be employed on the Project to whom the exemption will be applied and for whom the Contractor's or subcontractor's benefit plan coverage and payment of costs will be maintained; and
- 3) A calculation of the combined Contractor or subcontractor and employee costs for such programs expressed as an hourly cost based upon an assumed average monthly work hours of one hundred and sixty (160) hours.

The requested terms and conditions of alternative benefits for the requested core employees must be approved by the Signatory Labor Organization, and are as follows;

- A. The core employees in this request shall be paid in accordance to the agreed terms for the duration of their employment on the Project. Any core employee may request in writing to cease participation in the Contractor's or subcontractor's plan. Effective on the date of the request, the Contractor or subcontractor shall make contributions on that employee's behalf to the appropriate Trust Fund for the duration of employment on the project.
- B. For all other employees not submitted with this request, shall have their contributions paid to the applicable Trust Funds in accordance with the terms of the CWA.

- C. Copies of all remittance forms confirming compliance with all Trust or benefit program requirements shall be submitted monthly to the Administrator.
- D. If the Contractor or subcontractor has only one of the two qualifying benefits, either Pension or Health and Welfare plans, and not the other, the Contractor then must participate in the appropriate Trust Fund for the benefit that they do not provide.
- E. Any difference between the Contractor or subcontractor benefit amount and the Signatory Labor organization benefit amount shall be paid on the check so that the total is equal to the appropriate prevailing wage determination.
- F. The Contractor or subcontractors must pay the prevailed amount into the appropriate Training Trust Funds for the appropriate Signatory Labor Organization.
- G. These conditions may be altered by mutual agreement, in writing, only by the Contractors or subcontractors signing this appendix and the signatory labor organization affected.

Submitted By:

Contractor or subcontractor

Date

Alternative benefits as requested are Agreed and approved by:

Signatory Labor Organization

Date

