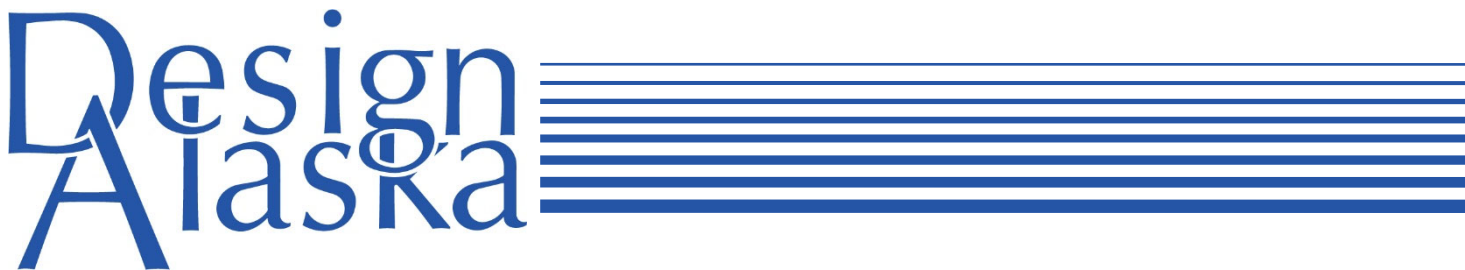


**City of Fairbanks
City Hall Heating System Replacement
Fairbanks, Alaska**

Bid Documents

**For:
Jeff Whipple
City of Fairbanks Engineering Dept.
800 Cushman St.,
Fairbanks, Alaska**

**August 21, 2025
Bidding Documents Revised April 14, 2026**



City of Fairbanks City Hall Heating System Replacement Fairbanks, Alaska

Bid Documents

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By:

**Design Alaska, Inc.
601 College Road
Fairbanks, AK 99701**

August 21, 2025

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**City of Fairbanks
City Hall Heating System Replacement Project
Fairbanks, Alaska**

Invitation to Bid: ITB 26-03

Sealed bids for the City Hall Heating System Replacement project for the City of Fairbanks located in Fairbanks, Alaska, will be received by the City Clerk's Office, 800 Cushman Street, Fairbanks, AK until **2:00 P.M.** local time, **May 21st, 2026**, and will immediately thereafter be publicly opened and read aloud in the Engineering Conference Room at the same address. Any bidder may review the bid tabulation after opening.

The Project is comprised of providing the 66,500 square-foot Fairbanks City Hall with hydronic terminal unit heating system. The existing steam terminal units and distribution piping will be demolished and replaced. Hazardous material abatement will be conducted with demolition work.

Complete bidding documents for this project will be available **April 17th, 2026** in electronic form. They may be viewed online and downloaded at <http://www.agcak.org>, <http://www.theplansroom.com>, <https://www.fairbanks.gov/finance/invitations-to-bid>. For the convenience and review by/of contractors, subcontractors, and suppliers, one complete hard copy set of contract documents, construction plans, and technical specifications is retained on file at the City of Fairbanks Engineering Department Office in City Hall, 800 Cushman Street.

A **Mandatory** pre-bid conference and site visit will be held at **2:00 PM, April 28th, 2026** in the Engineering Conference Room, 800 Cushman Street, Fairbanks, AK. All interested Prime Bidders, Sub-bidders, and Suppliers are invited to attend.

Addenda to the project will be posted on plans sites and emailed to plan holders that register with Project Manager Jeff Whipple. The bidder is responsible for periodically checking the site. The Contractor that is awarded the project will be responsible for printing all documents necessary to perform the work.

All questions relating to bidding procedures, design features, constructability, quantities, discrepancies, request for correction, or other technical aspects of the project must be submitted via email to the City of Fairbanks Engineering Department via JWhipple@fairbanks.gov, attention Jeff Whipple, Project Manager. Questions must be submitted to the Owner via email at least seven calendar days prior to the date fixed for the opening of the bids.

The City reserves the right to waive informalities not inconsistent with the law and to reject any or all bids.

PUBLISH: FAIRBANKS DAILY NEWS MINER, April 17th, 19th & 20th, 2026

ITB-26-03 CITY HALL HEATING SYSTEM REPLACEMENT

SUMMARY OF SCHEDULED DATES

- | | | |
|----|--------------------------------|--|
| A. | Advertise for Proposals | Fri April 17, Sun 19 & Mon 20, 2026 |
| B. | Pre-proposal Meeting | Tues April 28, 2026 2:00pm |
| C. | Site Inspection for Bidders | (as arranged with City Project Manager)
April 20 th - May 15 th M-F 8:00am-5:00pm |
| D. | Cutoff date for Questions | Wed May 13 th , 2026 |
| E. | Request for Proposals Due | Thur May 21 th , 2026 2:00 PM |
| F. | Project Substantial Completion | October 31, 2027 |

The City reserves the right to modify Scheduled dates.

DRAFT AIA® Document A701® - 2018

Instructions to Bidders

for the following Project:
(Name, location, and detailed description)

«City Hall Heating System Replacement»
«800 Cushman Street»
«Fairbanks, Alaska 99701 »

THE OWNER:

(Name, legal status, address, and other information)

«City of Fairbanks »« »
«800 Cushman Street »
«Fairbanks, Alaska 99701 »
« »

THE ARCHITECT:

(Name, legal status, address, and other information)

«Design Alaska Inc. »« »
«601 College Road »
«Fairbanks, Alaska 99701 »
« »

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ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™-2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.



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ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- .1 the Bidder has read and understands the Bidding Documents;
- .2 the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- .3 the Bid complies with the Bidding Documents;
- .4 the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- .5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- .6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)

« <http://www.agcak.org>, <http://www.theplansroom.com>, <https://www.fairbanks.gov/finance/invitations-to-bid> »

§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper

documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids.
(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)

« email Jeff Whipple, Project Manager JWhipple@fairbanks.gov »

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

§ 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents. *(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)*

« <http://www.agcak.org>, <http://www.theplansroom.com>, <https://www.fairbanks.gov/finance/invitations-to-bid> and individual email to registered plan holders with the City of Fairbanks at JWhiple@fairbanks.gov »

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:

(Insert the form and amount of bid security.)

« 10% of the first \$100,000 and 5% of the amount of the bid over \$100,000 to a maximum of \$200,000 »

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

§ 4.2.3 If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning «10 business » days after the opening of Bids, withdraw its Bid and request the return of its bid security.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:

(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)

« Bids shall be received in person by the City Clerk's Office, 800 Cushman Street, Fairbanks, AK in accordance with the requirements state within Article 4 of this document »

§ 4.3.2 Paper copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address, and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:

(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)

« »

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

§ 5.2 Rejection of Bids

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

§ 5.3 Acceptance of Bid (Award)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 Contractor's Qualification Statement

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

§ 6.2 Owner's Financial Capability

A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 Submittals

§ 6.3.1 After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
- .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.

(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)

« »

§ 7.2 Time of Delivery and Form of Bonds

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.
- .5 Drawings - dated 21 August 2025

- .6 Specifications - dated 21 August 2025

- .7 Addenda:

Number	Date	Pages

Proposal of _____ (hereinafter called the BIDDER), a corporation, organized and existing under the laws of the State of _____, a partnership, or an individual doing business as _____, to _____ (hereinafter called the OWNER).

A. The BIDDER, in compliance with your invitation for bids for the construction of the Project indicated above, having examined the plans and specifications with the related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the Project in accordance with the Contract Documents, within the time set forth therein, and for the price stated below.

B. The BIDDER hereby agrees to commence work under the Contract on the date of the AGREEMENT BETWEEN OWNER and CONTRACTOR and to fully complete the Project within the time stipulated in the Contract Documents. The BIDDER further agrees to pay all applicable liquidated damages in the sums as set forth in the Contract Documents.

C. The BIDDER acknowledges receipt of the following addenda:

ADDENDUM _____	DATE _____
ADDENDUM _____	DATE _____
ADDENDUM _____	DATE _____
ADDENDUM _____	DATE _____
ADDENDUM _____	DATE _____

D. The Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

E. An executed Bid Bond (AIA A-310) in the amount as indicated in A701 paragraph 4.2.1 is attached in accordance with contract documents.

F. Upon being offered for execution the agreement between Owner and Contractor, the Bidder will provide the required Performance and Payment Bonds and will execute the formal Agreement between Owner and Contractor within ten (10) days.

G. Local Bidders Preference of the lesser of five percent or \$50,000.00 applies to this contract.

BASIC PROPOSAL

To provide all labor, material, equipment, and supervision for Work indicated by and in strict accordance with these Contract Documents, not including Work specifically covered by the indicated Alternate Bid Items, for the total lump sum of

_____ dollars \$ _____
(Words) (Figures)

ALTERNATE BIDS

The following space is provided for bidders use in bidding Alternate added by addendum:

ALTERNATE NO. (Additive) (Deductive)

Add (Deduct) to (from) the Basic Bid for materials and work (not) required under this Alternate added by Addendum No. _____ consisting of:

_____ dollars \$ _____
(Words) (Figures)

NON-COLLUSION: I, or the firm, association or corporation of which I am a member, a bidder on the contract have not either directly nor indirectly entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with such contract.

NON-DEBARMENT: I am not, and the firm, association or corporation whom I represent is not presently suspended, debarred or otherwise deemed ineligible under federal law or the laws of any state to receive the award of a public contract.

Respectfully submitted,

(Seal if bid by Corporation)

By: _____

Title: _____

Date: _____

Business Address:

Alaska Contractor's License:

No. _____ Expires: _____

Alaska Business License:

No. _____ Expires: _____

Telephone: _____



AIA[®]

Document A310™ – 2010

Bid Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

BOND AMOUNT:

PROJECT:

(Name, location or address, and Project number, if any)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this _____ day of _____

(Contractor as Principal) *(Seal)*
(Witness)

(Title)

(Surety) *(Seal)*
(Witness)

(Title)

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

Init.

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AIA® Document A312® – 2010

Performance Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONSTRUCTION CONTRACT

Date:

Amount:

Description:

(Name and location)

BOND

Date:

(Not earlier than Construction Contract Date)

Amount:

Modifications to this Bond: None See Section 16

CONTRACTOR AS PRINCIPAL

Company: *(Corporate Seal)*

SURETY

Company: *(Corporate Seal)*

Signature: _____

Name
and Title:

(Any additional signatures appear on the last page of this Performance Bond.)

Signature: _____

Name
and Title:

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:

(Architect, Engineer or other party:)

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

- .1** the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;
- .2** the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
- .3** the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the 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 pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

- .1** After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
- .2** Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

- .1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
- .2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and
- .3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 **Balance of the Contract Price.** The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 **Construction Contract.** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 **Contractor Default.** Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 **Owner Default.** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 **Contract Documents.** All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

Sample

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL

SURETY

Company:

(Corporate Seal)

Company:

(Corporate Seal)

Signature: _____

Name and Title:

Address

Signature: _____

Name and Title:

Address



AIA Document A312[®] – 2010

Payment Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONSTRUCTION CONTRACT

Date:

Amount:

Description:

(Name and location)

BOND

Date:

(Not earlier than Construction Contract Date)

Amount:

Modifications to this Bond: None See Section 18

CONTRACTOR AS PRINCIPAL

Company: *(Corporate Seal)*

SURETY

Company: *(Corporate Seal)*

Signature: _____

Name
and Title:

(Any additional signatures appear on the last page of this Payment Bond.)

Signature: _____

Name
and Title:

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:

(Architect, Engineer or other party:)

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

- .1** have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
- .2** have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

- .1 the name of the Claimant;
- .2 the name of the person for whom the labor was done, or materials or equipment furnished;
- .3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- .4 a brief description of the labor, materials or equipment furnished;
- .5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- .6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- .7 the total amount of previous payments received by the Claimant; and
- .8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

Sample

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL

SURETY

Company:

(Corporate Seal)

Company:

(Corporate Seal)

Signature: _____

Name and Title:

Address

Signature: _____

Name and Title:

Address

DRAFT AIA® Document A101® - 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the « » day of « » in the year « »
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

«City of Fairbanks »« »
«800 Cushman Street »
«Fairbanks, AK 99701 »
« »

and the Contractor:
(Name, legal status, address and other information)

« »« »
« »
« »
« »

for the following Project:
(Name, location and detailed description)

«City Hall Heating System Replacement »
«800 Cushman Street »
«Fairbanks, AK 99701 »

The Architect:
(Name, legal status, address and other information)

«Design Alaska, Inc »« »
«601 College Road »
«Fairbanks, AK 99701 »
« »

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101®-2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®-2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS**
- 2 THE WORK OF THIS CONTRACT**
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION**
- 4 CONTRACT SUM**
- 5 PAYMENTS**
- 6 DISPUTE RESOLUTION**
- 7 TERMINATION OR SUSPENSION**
- 8 MISCELLANEOUS PROVISIONS**
- 9 ENUMERATION OF CONTRACT DOCUMENTS**

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

- «X»** The date of this Agreement.
- « »** A date set forth in a notice to proceed issued by the Owner.

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

- «X»** By the following date: **«October 31st, 2027 »**

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor’s performance of the Contract. The Contract Sum shall be « » (\$ « »), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. *(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)*

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum: *(Identify each allowance.)*

Item	Price

§ 4.4 Unit prices, if any: *(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)*

Item	Units and Limitations	Price per Unit (\$0.00)

§ 4.5 Liquidated damages, if any: *(Insert terms and conditions for liquidated damages, if any.)*

« \$500 a day after the substantial completion date for the entire project. »

§ 4.6 Other: *(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)*

« »

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month,

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the «7th » day of a month, the Owner shall make payment of the amount certified to the Contractor not later than «Thirty » («30 ») days after the Architect receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

« N/A »

§ 5.1.7.1.1 The following items are not subject to retainage:

(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

« N/A »

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

« N/A »

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:

(Insert any other conditions for release of retainage upon Substantial Completion.)

«N/A »

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner’s prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor’s responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner’s final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect’s final Certificate for Payment, or as follows:

« »

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Insert rate of interest agreed upon, if any.)

«within the provisions of AS 36.90.020 »

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

«City Engineer (interim Tim Zinna »

«800 Cushman Street »

«Fairbanks, AK 99701 »

«907-450-6745 »

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

[] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[] Litigation in a court of competent jurisdiction

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:

(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)

« »

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:

(Name, address, email address, and other information)

«Jeff Whipple »
«Project Manager »
«800 Cushman Street »
«Fairbanks, AK 99701 »
«jwhipple@fairbank.gov »
«907-459-6743 »

§ 8.3 The Contractor’s representative:

(Name, address, email address, and other information)

« »
« »
« »
« »
« »
« »

§ 8.4 Neither the Owner’s nor the Contractor’s representative shall be changed without ten days’ prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.7 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction
- .5 Drawings – Dated 21 August 2025

[Redacted]

- .6 Specifications – Dated 21 August 2025

[Redacted]

- .7 Addenda, if any:

Number	Date	Pages
[Redacted]	[Redacted]	[Redacted]

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

- .9 Other documents, if any, listed below:

(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor’s bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

This Agreement entered into as of the day and year first written above.

OWNER (Signature)

<< >><>

(Printed name and title)

CONTRACTOR (Signature)

<< >><>

(Printed name and title)

DRAFT AIA® Document A101® - 2017

Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the « » day of « » in the year « »
(In words, indicate day, month and year.)

for the following **PROJECT**:
(Name and location or address)

«City Hall Heating Replacement »
«800 Cushman Street, Fairbanks, AK »

THE OWNER:
(Name, legal status and address)

«City of Fairbanks »« »
«800 Cushman Street, Fairbanks, AK 99701 »

THE CONTRACTOR:
(Name, legal status and address)

« »« »
« »

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- A.2 OWNER'S INSURANCE
- A.3 CONTRACTOR'S INSURANCE AND BONDS
- A.4 SPECIAL TERMS AND CONDITIONS

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201™-2017, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

§ A.2.2 Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual general liability insurance.

§ A.2.3 Required Property Insurance

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This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Document A201®-2017, General Conditions of the Contract for Construction. Article 11 of A201®-2017 contains additional insurance provisions.



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§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

§ A.2.3.1.1 Causes of Loss. The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:

(Indicate below the cause of loss and any applicable sub-limit.)

Causes of Loss	Sub-Limit
	N/A

§ A.2.3.1.2 Specific Required Coverages. The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:

(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)

Coverage	Sub-Limit
	N/A

§ A.2.3.1.3 Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

§ A.2.3.1.4 Deductibles and Self-Insured Retentions. If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

§ A.2.3.2 Occupancy or Use Prior to Substantial Completion. The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

§ A.2.3.3 Insurance for Existing Structures

If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

§ A.2.4 Optional Extended Property Insurance.

The Owner shall purchase and maintain the insurance selected and described below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)

[] **§ A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance**, to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.

[] **§ A.2.4.2 Ordinance or Law Insurance**, for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.

[] **§ A.2.4.3 Expediting Cost Insurance**, for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.

[] **§ A.2.4.4 Extra Expense Insurance**, to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.

[] **§ A.2.4.5 Civil Authority Insurance**, for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.

[] **§ A.2.4.6 Ingress/Egress Insurance**, for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.

[] **§ A.2.4.7 Soft Costs Insurance**, to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

§ A.2.5 Other Optional Insurance.

The Owner shall purchase and maintain the insurance selected below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)

[« »] **§ A.2.5.1 Cyber Security Insurance** for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information. *(Indicate applicable limits of coverage or other conditions in the fill point below.)*

« »

[« »] **§ A.2.5.2 Other Insurance**
(List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage	Limits
----------	--------

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

§ A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.

§ A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

« »

§ A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than **«one million »** (\$ **«1,000,000 »**) each occurrence, **«two million »** (\$ **«2,000,000 »**) general aggregate, and **«two million »** (\$ **«2,000,000 »**) aggregate for products-completed operations hazard, providing coverage for claims including

- .1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
- .2 personal injury and advertising injury;
- .3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;

- .4 bodily injury or property damage arising out of completed operations; and
- .5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

- .1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
- .2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
- .3 Claims for bodily injury other than to employees of the insured.
- .4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.
- .5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
- .6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
- .7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
- .8 Claims related to roofing, if the Work involves roofing.
- .9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
- .10 Claims related to earth subsidence or movement, where the Work involves such hazards.
- .11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than «one million» (\$ «1,000,000») per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.2.6 Employers' Liability with policy limits not less than «one million» (\$ «1,000,000») each accident, «one million» (\$ «1,000,000») each employee, and «one million» (\$ «1,000,000») policy limit.

§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks – N/A

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than «» (\$ «») per claim and «» (\$ «») in the aggregate.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than «» (\$ «») per claim and «» (\$ «») in the aggregate.

§ A.3.2.11 Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than «» (\$ «») per claim and «» (\$ «») in the aggregate.

§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

« N/A »

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.

(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

- § A.3.3.2.1 Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below:
(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)

« »

- § A.3.3.2.2 Railroad Protective Liability Insurance, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate, for Work within fifty (50) feet of railroad property.

- § A.3.3.2.3 Asbestos Abatement Liability Insurance, with policy limits of not less than «one million » (\$ «1,000,000 ») per claim and «one million » (\$ «1,000,00 ») in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

- § A.3.3.2.4 Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

- § A.3.3.2.5 Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

- § A.3.3.2.6 Other Insurance
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage

Limits

§ A.3.4 Performance Bond and Payment Bond

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:
(Specify type and penal sum of bonds.)

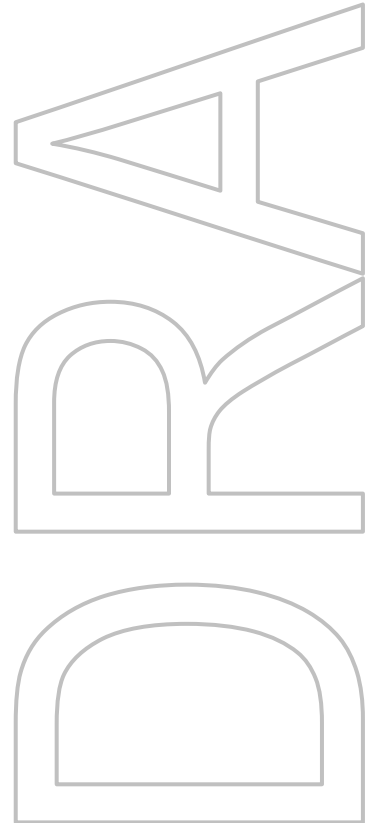
Type	Penal Sum (\$0.00)
Payment Bond	100% of contract price
Performance Bond	100% of contract price

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

<< >>



DRAFT AIA® Document A201® - 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

«City Hall Heating System Replacement »
«800 Cushman Street »

THE OWNER:

(Name, legal status and address)

«City of Fairbanks »« »
«800 Cushman Street, Fairbanks, AK 99701 »

THE ARCHITECT:

(Name, legal status and address)

«Design Alaska, Inc »« »
«601 College Road, Fairbanks, AK 99701 »

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and 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 any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon written protocols governing the transmission and use of, and reliance on, Instruments of Service or any other information or documentation in digital form.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to written protocols governing the use of, and reliance on, the information contained in the model shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These

obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

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

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and

other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to

injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed.

However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term “Sub-subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor’s Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, 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 terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor’s Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor’s rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor’s compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations 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 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;

- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

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

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. 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.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

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

- .1 employees on the Work and other persons who may be affected thereby;

- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as 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 comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

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

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

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner 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 the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's 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 and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities

proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the

procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the 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 the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public

authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.



MINIMUM RATES OF PAY For Laborers and Mechanics

Effective Sept. 1, 2025

Issue 51

PAMPHLET No. 600

Title 36. Public Contracts
AS 36.05

**DEPARTMENT OF LABOR
AND WORKFORCE DEVELOPMENT**
Wage and Hour



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September 1, 2025

TO ALL CONTRACTING AGENCIES:

At the Alaska Department of Labor and Workforce Development our goal is putting Alaskans to work. This pamphlet is designed to help contractors awarded public construction contracts understand the most significant laws of the State of Alaska pertaining to prevailing wages.

This pamphlet identifies current prevailing wage rates for public construction contracts (any construction projects awarded for the State of Alaska or its political subdivisions, such as local governments and certain non-profit organizations). Because these rates may change in a subsequent determination, please be sure you are using the appropriate rates. The rates published in this edition become effective September 1, 2025.

The prevailing wage rates contained in this pamphlet are applicable to public construction projects with a final bid date of September 11, 2025, or later. As the law now provides, these rates will remain stable during the life of a contract or for 24 calendar months, whichever is shorter. **On the date the prime contract is awarded, the 24-month period begins.** Upon expiration of this period, the latest wage rates issued by the department shall become effective for a subsequent 24-month period or until the original contract is completed, whichever occurs first. This process shall be repeated until the original contract is completed.

The term “original contract” means the signed contract that resulted from the original bid and any amendments, including changes of work scope, additions, extensions, change orders, and other instruments agreed to by the parties that have not been subject to subsequent open bid procedures. If a higher federal rate is required due to partial federal funding or other federal participation, the higher rate must be paid.

Effective July 1, 2025, Alaska Statutes 23.10.066–23.10.069 (Alaska’s Paid Sick Leave Requirements) take effect. Accordingly, for all projects bid after this date, contractors must comply with the paid sick leave provisions. When calculating the regular rate for sick time, contractors are required to include prevailing wages, specifically the base hourly rate (BHR), for all hours worked on site in accordance with the applicable pamphlet.

For additional copies of this pamphlet go to: <http://labor.state.ak.us/lss/pamp600.htm> and for questions regarding prevailing wage or employment preference requirements, please contact the nearest Wage and Hour office. These offices are listed on Page x.

Sincerely,

A handwritten signature in blue ink that reads "Catherine Muñoz".

Catherine Muñoz
Commissioner

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Wage Rates Pages 1-27

On the cover: Travis Jones fixes a tug luggage tractor, photo by Kim Unzicker

Note to Readers: The statutes and administrative regulations listed in this publication were taken from the official codes, as of the effective date of the publication. However, there may be errors or omissions that have not been identified and changes that occurred after the publication was printed. This publication is intended as an informational guide only and is not intended to serve as a precise statement of the statutes and regulations of the State of Alaska. To be certain of current laws and regulations, please refer to the official codes.

EXCERPTS FROM ALASKA LAW

Sec. 36.05.005. Applicability.

This chapter applies only to a public construction contract that exceeds \$25,000.

Sec. 36.05.010. Wage rates on public construction.

A contractor or subcontractor who performs work on a public construction contract in the state shall pay not less than the current prevailing rate of wages for work of a similar nature in the region in which the work is done. The current prevailing rate of wages is that contained in the latest determination of prevailing rate of wages issued by the Department of Labor and Workforce Development at least 10 days before the final date for submission of bids for the contract. The rate shall remain in effect for the life of the contract or for 24 calendar months, whichever is shorter. At the end of the initial 24-month period, if new wage determinations have been issued by the department, the latest wage determination shall become effective for the next 24-month period or until the contract is completed, whichever occurs first. This process shall be repeated until the contract is completed.

Sec. 36.05.040. Filing schedule of employees, wages paid, and other information.

All contractors or subcontractors who perform work on a public construction contract for the state or for a political subdivision of the state shall, before the Friday of every second week, file with the Department of Labor and Workforce Development a sworn affidavit for the previous reporting period, setting out in detail the number of persons employed, wages paid, job classification of each employee, hours worked each day and week, and other information on a form provided by the Department of Labor and Workforce Development.

Sec. 36.05.045. Notice of work and completion; withholding of payment.

- (a) Before commencing work on a public construction contract, the person entering into the contract with a contracting agency shall designate a primary contractor for purposes of this section. Before work commences, the primary contractor shall file a notice of work with the Department of Labor and Workforce Development. The notice of work must list work to be performed under the public construction contract by each contractor who will perform any portion of work on the contract and the contract price being paid to each contractor. The primary contractor shall pay all filing fees for each contractor performing work on the contract, including a filing fee based on the contract price being paid for work performed by the primary contractor's employees. The filing fee payable shall be the sum of all fees calculated for each contractor. The filing fee shall be one percent of each contractor's contract price. The total filing fee payable by the primary contractor under this subsection may not exceed \$5,000. In this subsection, "contractor" means an employer who is using employees to perform work on the public construction contract under the contract or a subcontract.
- (b) Upon completion of all work on the public construction contract, the primary contractor shall file with the Department of Labor and Workforce Development a notice of completion together with payment of any additional filing fees owed due to increased contract amounts. Within 30 days after the department's receipt of the primary contractor's notice of completion, the department shall inform the contracting agency of the amount, if any, to be withheld from the final payment.
- (c) A contracting agency
 - (1) may release final payment of a public construction contract to the extent that the agency has received verification from the Department of Labor and Workforce Development that
 - (A) the primary contractor has complied with (a) and (b) of this section;
 - (B) the Department of Labor and Workforce Development is not conducting an investigation under this title; and
 - (C) the Department of Labor and Workforce Development has not issued a notice of a violation of this chapter to the primary contractor or any other contractors working on the public construction contract; and

- (2) shall withhold from the final payment an amount sufficient to pay the department's estimate of what may be needed to compensate the employees of any contractors under investigation on this construction contract, and any unpaid filing fees.
- (d) The notice and filing fee required under (a) of this section may be filed after work has begun if
 - (1) The public construction contract is for work undertaken in immediate response to an emergency; and
 - (2) The notice and fees are filed not later than 14 days after the work has begun.
- (e) A false statement made on a notice required by this section is punishable under AS 11.56.210.

Sec. 36.05.060. Penalty for violation of this chapter.

A contractor who violates this chapter is guilty of a misdemeanor and upon conviction is punishable by a fine of not less than \$100 nor more than \$1,000, or by imprisonment for not less than 10 days nor more than 90 days, or by both. Each day a violation exists constitutes a separate offense.

Sec. 36.05.070. Wage rates in specifications and contracts for public works.

- (a) The advertised specifications for a public construction contract that requires or involves the employment of mechanics, laborers, or field surveyors must contain a provision stating the minimum wages to be paid various classes of laborers, mechanics, or field surveyors and that the rate of wages shall be adjusted to the wage rate under AS 36.05.010.
- (b) Repealed by §17 ch 142 SLA 1972.
- (c) A public construction contract under (a) of this section must contain provisions that
 - (1) the contractor or subcontractors of the contractor shall pay all employees unconditionally and not less than once a week;
 - (2) wages may not be less than those stated in the advertised specifications, regardless of the contractual relationship between the contractor or subcontractors and laborers, mechanics, or field surveyors;
 - (3) the scale of wages to be paid shall be posted by the contractor in a prominent and easily accessible place at the site of the work;
 - (4) the state or a political subdivision shall withhold so much of the accrued payments as is necessary to pay to laborers, mechanics, or field surveyors employed by the contractor or subcontractors the difference between
 - (A) the rates of wages required by the contract to be paid laborers, mechanics, or field surveyors on the work; and
 - (B) the rates of wages in fact received by laborers, mechanics, or field surveyors.

Sec. 36.05.080. Failure to pay agreed wages.

Every contract within the scope of AS 36.05.070 shall contain a provision that if it is found that a laborer, mechanic, or field surveyor employed by the contractor or subcontractor has been or is being paid a rate of wages less than the rate of wages required by the contract to be paid, the state or its political subdivision may, by written notice to the contractor, terminate the contractor's right to proceed with the work or the part of the work for which there is a failure to pay the required wages and to prosecute the work to completion by contract or otherwise, and the contractor and the contractor's sureties are liable to the state or its political subdivision for excess costs for completing the work.

Sec. 36.05.090. Payment of wages from withheld payments and listing contractors who violate contracts.

- (a) The state disbursing officer in the case of a state public construction contract and the local fiscal officer in the case of a political subdivision public construction contract shall pay directly to laborers, mechanics, or field surveyors from accrued payments withheld under the terms of the contract the wages due laborers, mechanics, or field surveyors under AS 36.05.070.
- (b) The state disbursing officer or the local fiscal officer shall distribute to all departments of the state government and to all political subdivisions of the state a list giving the names of persons who have disregarded their obligations to employees. A person appearing on this list and a firm, corporation, partnership, or association in which the person has an interest may not work as a contractor or

subcontractor on a public construction contract for the state or a political subdivision of the state until three years after the date of publication of the list. If the accrued payments withheld under the contract are insufficient to reimburse all the laborers, mechanics, or field surveyors with respect to whom there has been a failure to pay the wages required under AS 36.05.070, the laborers, mechanics, or field surveyors have the right of action or intervention or both against the contractor and the contractor's sureties conferred by law upon persons furnishing labor or materials, and in the proceedings it is not a defense that the laborers, mechanics, or field surveyors accepted or agreed to accept less than the required rate of wages or voluntarily made refunds.

Sec. 36.05.900. Definition.

In this chapter, "contracting agency" means the state or a political subdivision of the state that has entered into a public construction contract with a contractor.

EXCERPTS FROM ALASKA ADMINISTRATIVE CODE

*****Notice:** Regulations relating to board and lodging and per diem went into effect on November 25, 2018. The new regulations are excerpted here***

8 AAC 30.051. Purpose. The purpose of 8 AAC 30.052 – 8 AAC 30.056 is to ensure that wages paid to laborers, mechanics, and field surveyors do not fall below the prevailing rate of pay.

8 AAC 30.052. Board and lodging; remote sites. (a) A contractor on a public construction project located 65 or more road miles from the international airport closest to the project area in either Fairbanks, Juneau, or Anchorage, or that is inaccessible by road in a two-wheel drive vehicle, shall provide adequate board and lodging to each laborer, mechanic, or field surveyor while the person is employed on the project. If commercial lodging facilities are not available, the contractor shall provide temporary lodging facilities. Lodging facilities must comply with all applicable state and federal laws. For a highway project, the location of the project is measured from the midpoint of the project.

(b) A contractor is not required to provide board and lodging:

(1) to a laborer, mechanic, or field surveyor who is a domiciled resident of the project area; or

(2) on a laborer, mechanic, or field surveyor's scheduled days off, when the person can reasonably travel between the project and the person's permanent residence; for the purposes of this paragraph, "scheduled day off" means a day in which a person does not perform work on-site, is not required to remain at or near the job location for the benefit of the contractor, and is informed of the day off at least seven days before the day off.

(c) Upon a contractor's written request, the commissioner may waive the requirements of (a) of this section where:

(1) the project is inaccessible by road in a two-wheel drive vehicle, but the laborer, mechanic, or field surveyor can reasonably travel between the project and the person's permanent residence within one hour; or

(2) a laborer, mechanic, or field surveyor is not a domiciled resident of the project area, but has established permanent residence, with the intent to remain indefinitely, within 65 road miles of the project, or for a highway project, the mid-point of the project.

8 AAC 30.054. Per diem instead of board and lodging. (a) A contractor may pay a laborer, mechanic, or field surveyor per diem instead of providing board and lodging, when the following conditions are met:

(1) the department determines that per diem instead of board and lodging is an established practice for the work classification; the department shall publish and periodically revise its determinations in the pamphlet *Laborers and Mechanics Minimum Rates of Pay*;

(2) the contractor pays each laborer, mechanic, or field surveyor the appropriate per diem rate as published and periodically revised in the pamphlet *Laborers and Mechanics Minimum Rates of Pay*; and

(3) the contractor pays the per diem to each laborer, mechanic, or field surveyor on the same day that wages are paid.

(b) A contractor may not pay per diem instead of board and lodging on a highway project located

- (1) west of Livengood on the Elliot Highway, AK-2;
- (2) on the Dalton Highway, AK-11;
- (3) north of milepost 20 on the Taylor Highway, AK-5;
- (4) east of Chicken on the Top of the World Highway; or
- (5) south of Tetlin Junction to the Alaska-Canada border on the Alaska Highway, AK-2.

8 AAC 30.056. Alternative arrangement. Upon a contractor’s written request, the commissioner may approve an alternative board and lodging or per diem arrangement, provided

- (1) the arrangement does not reduce the laborer, mechanic, or field surveyor’s wages below the prevailing wage rate; and
- (2) the laborer, mechanic, or field surveyor voluntarily enters into and signs the written arrangement; a labor organization representing laborers, mechanics, or field surveyors may enter into the written agreement on their behalf.

8 AAC 30.900. General definitions (selected excerpts only):

In this chapter and in AS 36

- (22) “domiciled resident” means a person living within 65 road miles of a public construction project, or in the case of a highway project, the mid-point of the project, for at least 12 consecutive months prior to the award of the public construction project;
- (23) “employed on the project” means the time period from the date the laborer, mechanic, or field surveyor first reports on-site to the project through the final date the person reports on-site to the project.

ADDITIONAL INFORMATION

PER DIEM

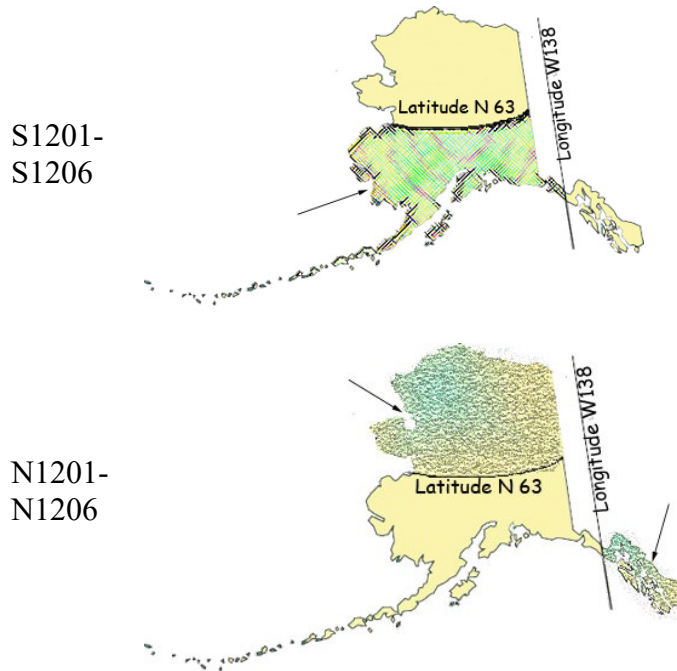
Notice: New regulations relating to board and lodging and per diem went into effect on November 25, 2018. The regulations provide a comprehensive set of requirements for the provision of board and lodging or per diem for workers on remote projects. Please refer to Alaska Administrative Code 8 AAC Chapter 30 and read the chapter carefully.

The Alaska Department of Labor and Workforce Development has determined that per diem is an established work practice for certain work classifications. These classifications are indicated throughout the Pamphlet by an asterisk (*) under the classification title. If all of the conditions of 8 AAC 30.054 are met, an employer may pay workers in these classifications per diem instead of providing board and lodging on a remote project.

Per Diem Rate: As of May 1, 2019, the minimum per diem rate is \$100.00 per day, or part thereof, the worker is employed on the project. In the event that a contractor provides lodging facilities, but no meals, the department will accept a payment of \$48 per day for meals to meet the per diem requirements.

LABORER CLASSIFICATION CLARIFICATION

The laborer rates categorized in class code S1201-S1206 apply in one area of Alaska; the area that is south of N63 latitude and west of W138 Longitude. The laborer rates categorized in class code N1201-N1206 apply in two areas of Alaska; the Alaska areas north of N63 latitude and east of W138 longitude. The following graphic representations should assist with clarifying the applicable wage rate categories:



APPRENTICE RATES

Apprentice rates at less than the minimum prevailing rates may be paid to apprentices according to an apprentice program which has been registered and approved by the Commissioner of the Alaska Department of Labor and Workforce Development in writing or according to a bona fide apprenticeship program registered with the U.S. Department of Labor, Office of Apprenticeship Training. **Any employee listed on a payroll at an apprentice wage rate who is not registered as above shall be paid the journeyman prevailing minimum wage in that work classification.** Wage rates are based on prevailing crew makeup practices in Alaska and apply to work performed regardless of either the quality of the work performed by the employee or the titles or classifications which may be assigned to individual employees.

FRINGE BENEFIT PLANS

Contractors/subcontractors may compensate fringe benefits to their employees in any one of three methods. The fringe benefits may be paid into a union trust fund, into an approved benefit plan, or paid directly on the paycheck as gross wages.

Where fringe benefits are paid into approved plans, funds, or programs including union trust funds, the payments must be contributed at least monthly. If contractors submit their own payroll forms and are paying fringe benefits into approved plans, funds, or programs, the employer's certification must include, in addition to those requirements of 8 AAC 30.020(c), a statement that fringe benefit payments have been or will be paid at least monthly. Contractors who pay fringe benefits to a plan must ensure the plan is one approved by the Internal Revenue Service and that the plan meets the requirements of 8 AAC 30.025 (eff. 3/2/08) in order for payments to be credited toward the prevailing wage obligation.

PAID SICK LEAVE

Effective July 1, 2025, the provisions of Alaska Statutes 23.10.066–23.10.069, relating to paid sick leave, shall apply. For all projects bid after July 1, 2025, contractors are required to comply with these statutory provisions. The regular rate of pay for sick leave must be calculated to include prevailing wages, defined as the base hourly rate (BHR), for all hours worked on site in accordance with the applicable pamphlet.

SPECIAL PREVAILING WAGE RATE DETERMINATION

Special prevailing wage rate determinations may be requested for special projects or a special worker classification if the work to be performed does not conform to traditional public construction for which a prevailing wage rate has been established under 8 AAC 30.050(a) of this section. Requests for special wage rate determinations must be in writing and filed with the Commissioner at least 30 days before the award of the contract. An applicant for a special wage rate determination shall have the responsibility to support the necessity for the special rate. An application for a special wage rate determination filed under this section must contain:

- (1) a specification of the contract or project on which the special rates will apply and a description of the work to be performed;
- (2) a brief narrative explaining why special wage rates are necessary;
- (3) the job class or classes involved;
- (4) the special wage rates the applicant is requesting, including survey or other relevant wage data to support the requested rates;
- (5) the approximate number of employees who would be affected; and
- (6) any other information which might be helpful in determining if special wage rates are appropriate.

Requests made pursuant to the above should be addressed to:

Director
 Alaska Department of Labor and Workforce Development
 Labor Standards and Safety Division
 Wage and Hour
 P.O. Box 111149
 Juneau, AK 99811-1149
 -or-
 Email: statewide.wagehour@alaska.gov

EMPLOYMENT PREFERENCE INFORMATION

In October 2019, the Alaska Attorney General issued a formal opinion stating that the Alaska Statutes 36.10.150 of the State’s 90% Employment Preference law, also known as the Alaska Resident Hire law, violates both the U.S. and Alaska Constitutions. As a result, the state has stopped all enforcement activity. A copy of the Attorney General opinion is found here:

http://law.alaska.gov/pdf/opinions/opinions_2019/19-005_AK-hire.pdf

**Alaska Department of Labor and Workforce Development
Labor Standards and Safety Division
Wage and Hour
Web site: <http://labor.state.ak.us/lss/pamp600.htm>**

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Email:
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LABOR STANDARDS AND SAFETY NOTICE REQUESTS

If you would like to receive Wage and Hour or Mechanical Inspection **regulation notices** or **publications information**, they are available via electronic mail, by signing up in the GovDelivery System, <https://public.govdelivery.com/accounts/AKDOL/subscriber/new> and selecting topics *LSS – Wage and Hour – Forms and Publications*, *LSS – Mechanical Inspection Regulations*, or *LSS – Wage and Hour Regulations*.

Publications are also available online at <http://labor.alaska.gov/lss/home.htm>

DEBARMENT LIST

AS 36.05.090(b) states that “the state disbursing officer or the local fiscal officer shall distribute to all departments of the state government and to all political subdivisions of the state a list giving the names of persons who have disregarded their obligations to employees.”

A person appearing on the following debarment list and a firm, corporation, partnership, or association in which the person has an interest may not work as a contractor or subcontractor on a public construction contract for the state or a political subdivision of the state for three years from the date of debarment.

Company Name

Debarment Expires

No companies are currently debarred.

Laborers' & Mechanics' Minimum Rates of Pay

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Boilermakers

*See per diem note on last page

A0101	Boilermaker (journeyman)	54.08	8.57	18.72	2.50	VAC 4.25	SAF 0.34	88.46
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Bricklayers & Allied Craftworkers

*See per diem note on last page

A0201	Blocklayer, including:	52.77	9.91	0.66	L&M 0.20	ANU 2.45	65.99
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Bricklayer
 Marble Mason
 Refractory Worker (Firebrick, Plastic, Castable, and Gunitite Refractory Applications)
 Stone Mason
 Terrazzo Worker
 Tile Setter

A0202	Pointer/Caulker/Cleaner (PCC)	52.77	9.91	0.66	L&M 0.20	ANU 2.45	65.99
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Caulker
 Cleaner
 Tuck Pointer

A0203	Finisher	40.91	10.03	0.54	L&M 0.20	ANU 2.45	54.13
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Marble Finisher
 Terrazzo Finisher
 Tile Finisher

A0204	Torginal Applicator	40.91	10.03	0.54	L&M 0.20	ANU 2.45	54.13
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Carpenters, Region I (North of 63 latitude)

*See per diem note on last page

N0301	Carpenter (journeyman)	50.79	8.75	16.80	0.77	L&M 0.10	SAF	77.21
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Lather/Drywall/Acoustical

Carpenters, Region II (South of N63 latitude)

*See per diem note on last page

S0301	Carpenter (journeyman)	50.79	8.75	17.34	0.77	L&M 0.10	SAF	77.75
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Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Carpenters, Region II (South of N63 latitude)

*See per diem note on last page

S0301	Carpenter (journeyman)	50.79	8.75	17.34	0.77		L&M	SAF	
	Lather/Drywall/Acoustical						0.10		77.75

Cement Masons

*See per diem note on last page

A0401	Group I, including:	49.28	8.80	11.80	1.68		L&M		71.66
	Application of Sealing Compound								
	Application of Underlayment								
	Building, General								
	Cement Finisher								
	Cement Mason (journeyman)								
	Concrete								
	Concrete Paving								
	Concrete Polishing								
	Concrete Repair								
	Curb & Gutter, Sidewalk								
	Curing of All Concrete								
	General Concrete Pour Tender								
	Grouting & Caulking of Tilt-Up Panels								
	Grouting of All Plates								
	Patching Concrete								
	Screed Pin Setter								
	Screeder or Rodder								
	Spackling/Skim Coating								

A0402	Group II, including:	49.28	8.80	11.80	1.68		L&M		71.66
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Form Setter

A0403	Group III, including:	49.28	8.80	11.80	1.68		L&M		71.66
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- Concrete Saw Cutter Operator (All Control Joints and Self-powered)
- Curb & Gutter Machine
- Floor Grinder
- Pneumatic Power Tools
- Power Chipping & Bushing
- Sand Blasting Architectural Finish
- Screed & Rodding Machine Operator
- Troweling Machine Operator (all concrete surfaces)

A0404	Group IV, including:	49.28	8.80	11.80	1.68		L&M		71.66
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Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Cement Masons
 *See per diem note on last page

							L&M	
A0404	Group IV, including:	49.28	8.80	11.80	1.68	0.10		71.66
	Acoustical or Imitation Acoustical Finish							
	Application of All Composition Mastic							
	Application of All Epoxy Finishes on Concrete Surfaces							
	Application of All Plastic Material							
	Finish Colored Concrete							
	Guniting Nozzleman							
	Hand Powered Grinder							
	Preparing, scratching and browsing of all ceilings and walls, finished with terrazzo or tile							
	Tunnel Worker							

							L&M	
A0405	Group V, including:	49.28	8.80	11.80	1.68	0.10		71.66
	Casting and finishing							
	EIFS Systems							
	Finishing of all interior and exterior plastering							
	Fireproofing (Pryocrete, Cafco, Albi-Clad, sprayed fiberglass)							
	Gypsum, Portland Cement							
	Kindred material and products							
	Operation and control of all types of plastering machines, including power tools and floats, used by the industry							
	Overcoating and maintenance of interior/exterior plaster surfaces							
	Plasterer							
	Support and control of all concrete 3D printing operations (Excluding Paint)							
	Use of 3D structural and architectural printing and finishes							
	Use of sustainable materials and equipment practices							
	Veneer plastering process (Rapid Plaster, U.S.G. "Imperial Systems", and Pabcoat Systems")							
	Venetian plaster and color-integrated Italian/Middle-Eastern line plaster							

Culinary Workers

							LEG	
A0501	Baker/Cook	32.15	6.77	9.23				48.15
A0503	General Helper	28.23	6.77	9.23				44.23
	Housekeeper							
	Janitor							
	Kitchen Helper							

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
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Culinary Workers

A0504	Head Cook	32.15	6.77	9.23		LEG	48.15
A0505	Head Housekeeper	28.23	6.77	9.23		LEG	44.23
	Head Kitchen Help						

Dredgemen

*See per diem note on last page

A0601	Assistant Engineer	52.32	12.10	16.25	1.05	L&M 0.10	81.82
	Craneman						
	Electrical Generator Operator (primary pump/power barge/dredge)						
	Engineer						
	Welder						
A0602	Assistant Mate (deckhand)	50.93	12.10	16.25	1.05	L&M 0.10	80.43
A0603	Fireman	51.46	12.10	16.25	1.05	L&M 0.10	80.96
A0605	Leverman Clamshell	55.33	12.10	16.25	1.05	L&M 0.10	84.83
A0606	Leverman Hydraulic	53.23	12.10	16.25	1.05	L&M 0.10	82.73
A0607	Mate & Boatman	52.32	12.10	16.25	1.05	L&M 0.10	81.82
A0608	Oiler (dredge)	51.46	12.10	16.25	1.05	L&M 0.10	80.96

Electricians

*See per diem note on last page

A0701	Inside Cable Splicer	55.44	14.83	14.49	0.95	L&M 0.25	LEG 0.15	86.11
A0702	Inside Journeyman Wireman, including: Technicians (including use of drones in electrical construction)	55.44	14.83	14.49	0.95	L&M 0.25	LEG 0.15	86.11
A0703	Power Cable Splicer	74.34	14.83	19.92	0.95	L&M 0.25	LEG 0.15	110.44
A0704	Tele Com Cable Splicer	55.28	14.83	18.56	0.95	L&M 0.25	LEG 0.15	90.02

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Electricians
*See per diem note on last page

A0705	Power Journeyman Lineman, including: Power Equipment Operator Technician (including use of drones in electrical construction)	72.59	14.83	19.87	0.95	L&M	LEG	108.64
A0706	Tele Com Journeyman Lineman, including: Technician (including use of drones in telecommunications construction) Tele Com Equipment Operator	53.53	14.83	18.51	0.95	L&M	LEG	88.22
A0707	Straight Line Installer - Repairman	53.53	14.83	18.51	0.95	L&M	LEG	88.22
A0708	Powderman	70.59	14.83	19.81	0.95	L&M	LEG	106.58
A0710	Material Handler	29.57	15.34	5.89	0.15	L&M	LEG	51.25
A0712	Tree Trimmer Groundman	32.97	14.83	14.84	0.15	L&M	LEG	63.09
A0713	Journeyman Tree Trimmer	42.23	14.83	15.12	0.15	L&M	LEG	72.63
A0714	Vegetation Control Sprayer	45.91	14.83	15.23	0.15	L&M	LEG	76.42
A0715	Inside Journeyman Communications CO/PBX	55.44	14.83	14.49	0.95	L&M	LEG	86.11

Elevator Workers
*See per diem note on last page

A0802	Elevator Constructor	50.01	16.28	21.36	0.80	L&M	VAC	95.60
A0803	Elevator Constructor Mechanic	71.44	16.28	21.36	0.80	L&M	VAC	119.41

Heat & Frost Insulators/Asbestos Workers (North of 63rd Parallel)
*See per diem note on last page

N0902	Asbestos Abatement-Mechanical Systems	46.35	9.24	11.13	1.50	IAF	LML	68.45
N0904	Insulator, Group II	46.35	9.24	11.13	1.50	IAF	LML	68.45
N0905	Fire Stop	46.35	9.24	11.13	1.50	IAF	LML	68.45

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Heat & Frost Insulators/Asbestos Workers (South of 63rd Parallel)

*See per diem note on last page

S0902	Asbestos Abatement-Mechanical Systems	45.85	9.24	11.13	1.50	0.18	0.05	67.95
S0904	Insulator, Group II	45.85	9.24	11.13	1.50	0.18	0.05	67.95
S0905	Fire Stop	45.85	9.24	11.13	1.50	0.18	0.05	67.95

IronWorkers

*See per diem note on last page

A1101	Ironworkers, including:	48.48	10.41	26.45	1.12	0.20		86.66
	Bender Operators							
	Bridge & Structural							
	Hangar Doors							
	Hollow Metal Doors							
	Industrial Doors							
	Machinery Mover							
	Mass Timber Construction (Cross Laminate Timber)							
	Ornamental							
	Reinforcing							
	Rigger							
	Sheeter							
	Signalman							
	Stage Rigger							
	Toxic Haz-Mat Work							
	Welder							
A1102	Helicopter	49.48	10.41	26.45	1.12	0.20		87.66
	Helicopter (used for rigging and setting)							
	Tower (energy producing windmill type towers to include nacelle and blades)							
A1103	Fence/Barrier Installer	44.98	10.41	26.45	1.12	0.20		83.16
A1104	Guard Rail Layout Man	45.72	10.41	26.45	1.12	0.20		83.90
A1105	Guard Rail Installer	45.98	10.41	26.45	1.12	0.20		84.16

Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)

*See per diem note on last page

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)

*See per diem note on last page

						L&M	LEG	
N1201	Group I, including:	40.25	10.55	21.51	2.00	0.35	0.20	74.86
	Asphalt Worker (shovelman, plant crew)							
	Brush Cutter							
	Camp Maintenance Laborer							
	Carpenter Tender or Helper							
	Choke Setter, Hook Tender, Rigger, Signalman							
	Concrete Labor (curb & gutter, chute handler, curing, grouting, screeding)							
	Crusher Plant Laborer							
	Demolition Laborer							
	Ditch Digger							
	Dumpman							
	Environmental Laborer (hazard/toxic waste, oil spill)							
	Fence Installer							
	Fire Watch Laborer							
	Flagman							
	Form Stripper							
	General Laborer							
	Guardrail Laborer, Bridge Rail Installer							
	Hydro Seeder Nozzleman							
	Laborer, Building							
	Landscaper or Planter							
	Laying of Mortarless Decorative Block (retaining walls, flowered decorative block 4 feet or less - highway or landscape work)							
	Material Handler							
	Pneumatic or Power Tools							
	Portable or Chemical Toilet Serviceman							
	Pump Man or Mixer Man							
	Railroad Track Laborer							
	Sandblast, Pot Tender							
	Saw Tender							
	Slurry Work							
	Steam Cleaner Operator							
	Steam Point or Water Jet Operator							
	Storm Water Pollution Protection Plan Worker (SWPPP Worker - erosion and sediment control Laborer)							
	Tank Cleaning							
	Utiliwalk & Utilidor Laborer							
	Watchman (construction projects)							
	Window Cleaner							

N1202	Group II, including:	41.25	10.55	21.51	2.00	0.35	0.20	75.86
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Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)
 *See per diem note on last page

N1202	Group II, including:	41.25	10.55	21.51	2.00	L&M	LEG	75.86
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- Burning & Cutting Torch
- Cement or Lime Dumper or Handler (sack or bulk)
- Certified Erosion Sediment Control Lead (CESCL Laborer)
- Choker Splicer
- Chucktender (wagon, air-track & hydraulic drills)
- Concrete Laborer (power buggy, concrete saws, pumpcrete nozzleman, vibratorman)
- Culvert Pipe Laborer
- Cured Inplace Pipelayer
- Environmental Laborer (asbestos, marine work)
- Floor Preparation, Core Drilling
- Foam Gun or Foam Machine Operator
- Green Cutter (dam work)
- Gunite Operator
- Hod Carrier
- Jackhammer/Chipping Gun or Pavement Breaker
- Laser Instrument Operator
- Laying of Mortarless Decorative Block (retaining walls, flowered decorative block over 4 feet - highway or landscape work)
- Mason Tender & Mud Mixer (sewer work)
- Pilot Car
- Pipelayer Helper
- Plasterer, Bricklayer & Cement Finisher Tender
- Powderman Helper
- Power Saw Operator
- Railroad Switch Layout Laborer
- Sandblaster
- Scaffold Building & Erecting
- Sewer Caulker
- Sewer Plant Maintenance Man
- Thermal Plastic Applicator
- Timber Faller, Chainsaw Operator, Filer
- Timberman

N1203	Group III, including:	42.15	10.55	21.51	2.00	L&M	LEG	76.76
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- Bit Grinder
- Camera/Tool/Video Operator
- Guardrail Machine Operator
- High Rigger & Tree Topper
- High Scaler
- Multiplate

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)

*See per diem note on last page

N1203	Group III, including:	42.15	10.55	21.51	2.00		L&M	LEG	
							0.35	0.20	76.76

- Plastic Welding
- Slurry Seal Squeegee Man
- Traffic Control Supervisor
- Welding Certified (in connection with laborer's work)

N1204	Group IIIA	46.53	10.55	21.51	2.00		L&M	LEG	
							0.35	0.20	81.14

- Asphalt Raker, Asphalt Belly Dump Lay Down
- Drill Doctor (in the field)
- Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)
- Pioneer Drilling & Drilling Off Tugger (all type drills)
- Pipelayers
- Powderman (Employee Possessor)
- Storm Water Pollution Protection Plan Specialist (SWPPP Specialist)
- Traffic Control Supervisor, DOT Qualified

N1205	Group IV	29.82	10.55	21.51	2.00		L&M	LEG	
							0.35	0.20	64.43

- Final Building Cleanup
- Permanent Yard Worker

N1206	Group IIIB	54.01	5.50	21.51	1.60		L&M	LEG	
							0.35	0.20	83.17

- Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)(over 5,000 hours)
- Federal Powderman (Responsible Person in Charge)
- Grade Checking (setting or transferring of grade marks, line and grade, GPS, drones)
- Pioneer Drilling & Drilling Off Tugger (all type drills)(over 5,000 hours)
- Stake Hopper

Laborers (The area that is south of N63 latitude and west of W138 longitude)

*See per diem note on last page

S1201	Group I, including:	40.25	10.55	21.51	2.00		L&M	LEG	
							0.35	0.20	74.86

- Asphalt Worker (shovelman, plant crew)
- Brush Cutter
- Camp Maintenance Laborer
- Carpenter Tender or Helper
- Choke Setter, Hook Tender, Rigger, Signalman
- Concrete Labor (curb & gutter, chute handler, curing, grouting, screeding)

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Laborers (The area that is south of N63 latitude and west of W138 longitude)
 *See per diem note on last page

S1201	Group I, including:	40.25	10.55	21.51	2.00	L&M	LEG	74.86
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- Crusher Plant Laborer
- Demolition Laborer
- Ditch Digger
- Dumpman
- Environmental Laborer (hazard/toxic waste, oil spill)
- Fence Installer
- Fire Watch Laborer
- Flagman
- Form Stripper
- General Laborer
- Guardrail Laborer, Bridge Rail Installer
- Hydro Seeder Nozzleman
- Laborer, Building
- Landscaper or Planter
- Laying of Mortarless Decorative Block (retaining walls, flowered decorative block 4 feet or less - highway or landscape work)
- Material Handler
- Pneumatic or Power Tools
- Portable or Chemical Toilet Serviceman
- Pump Man or Mixer Man
- Railroad Track Laborer
- Sandblast, Pot Tender
- Saw Tender
- Slurry Work
- Steam Cleaner Operator
- Steam Point or Water Jet Operator
- Storm Water Pollution Protection Plan Worker (SWPPP Worker - erosion and sediment control Laborer)
- Tank Cleaning
- Utiliwalk & Utilidor Laborer
- Watchman (construction projects)
- Window Cleaner

S1202	Group II, including:	41.25	10.55	21.51	2.00	L&M	LEG	75.86
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- Burning & Cutting Torch
- Cement or Lime Dumper or Handler (sack or bulk)
- Certified Erosion Sediment Control Lead (CESCL Laborer)
- Choker Splicer
- Chucktender (wagon, air-track & hydraulic drills)
- Concrete Laborer (power buggy, concrete saws, pumcrete nozzleman, vibratorman)

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Laborers (The area that is south of N63 latitude and west of W138 longitude)

*See per diem note on last page

						L&M	LEG	
S1202	Group II, including:	41.25	10.55	21.51	2.00	0.35	0.20	75.86

- Culvert Pipe Laborer
- Cured Inplace Pipelayer
- Environmental Laborer (asbestos, marine work)
- Floor Preparation, Core Drilling
- Foam Gun or Foam Machine Operator
- Green Cutter (dam work)
- Gunite Operator
- Hod Carrier
- Jackhammer/Chipping Gun or Pavement Breaker
- Laser Instrument Operator
- Laying of Mortarless Decorative Block (retaining walls, flowered decorative block over 4 feet - highway or landscape work)
- Mason Tender & Mud Mixer (sewer work)
- Pilot Car
- Pipelayer Helper
- Plasterer, Bricklayer & Cement Finisher Tender
- Powderman Helper
- Power Saw Operator
- Railroad Switch Layout Laborer
- Sandblaster
- Scaffold Building & Erecting
- Sewer Caulker
- Sewer Plant Maintenance Man
- Thermal Plastic Applicator
- Timber Faller, Chainsaw Operator, Filer
- Timberman

						L&M	LEG	
S1203	Group III, including:	42.15	10.55	21.51	2.00	0.35	0.20	76.76

- Bit Grinder
- Camera/Tool/Video Operator
- Guardrail Machine Operator
- High Rigger & Tree Topper
- High Scaler
- Multiplate
- Plastic Welding
- Slurry Seal Squeegee Man
- Traffic Control Supervisor
- Welding Certified (in connection with laborer's work)

						L&M	LEG	
S1204	Group IIIA	46.53	10.55	21.51	2.00	0.35	0.20	81.14

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Laborers (The area that is south of N63 latitude and west of W138 longitude)

*See per diem note on last page

S1204	Group IIIA	46.53	10.55	21.51	2.00	L&M 0.35	LEG 0.20	81.14
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- Asphalt Raker, Asphalt Belly Dump Lay Down
- Drill Doctor (in the field)
- Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)
- Pioneer Drilling & Drilling Off Tugger (all type drills)
- Pipelayers
- Powderman (Employee Possessor)
- Storm Water Pollution Protection Plan Specialist (SWPPP Specialist)
- Traffic Control Supervisor, DOT Qualified

S1205	Group IV	29.82	10.55	21.51	2.00	L&M 0.35	LEG 0.20	64.43
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- Final Building Cleanup
- Permanent Yard Worker

S1206	Group IIIB	54.01	5.50	21.51	1.60	L&M 0.35	LEG 0.20	83.17
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- Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)(over 5,000 hours)
- Federal Powderman (Responsible Person in Charge)
- Grade Checking (setting or transferring of grade marks, line and grade, GPS, drones)
- Pioneer Drilling & Drilling Off Tugger (all type drills)(over 5,000 hours)
- Stake Hopper

Millwrights

*See per diem note on last page

A1251	Millwright (journeyman)	62.50	9.50	11.41	1.17	L&M 0.15	0.25	84.98
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A1252	Millwright Welder	63.50	9.50	11.41	1.17	L&M 0.15	0.25	85.98
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Painters, Region I (North of N63 latitude)

*See per diem note on last page

N1301	Group I, including:	43.05	10.15	15.20	1.10	L&M 0.10		69.60
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- Brush
- General Painter
- Hand Taping
- Hazardous Material Handler
- Lead-Based Paint Abatement

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Painters, Region I (North of N63 latitude)

*See per diem note on last page

N1301	Group I, including:	43.05	10.15	15.20	1.10		L&M 0.10	69.60
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Roll

N1302	Group II, including:	43.57	10.15	15.20	1.10		L&M 0.10	70.12
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- Bridge Painter
- Epoxy Applicator
- General Drywall Finisher
- Hand/Spray Texturing
- Industrial Coatings Specialist
- Machine/Automatic Taping
- Pot Tender
- Sandblasting
- Specialty Painter
- Spray
- Structural Steel Painter
- Wallpaper/Vinyl Hanger

N1304	Group IV, including:	46.76	10.15	19.21	1.10		0.10	77.32
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- Glazier
- Storefront/Automatic Door Mechanic

N1305	Group V, including:	39.48	10.15	5.00	1.10		0.10	55.83
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- Carpet Installer
- Floor Coverer
- Heat Weld/Cove Base
- Linoleum/Soft Tile Installer

N1306	Group VI, including:	69.78	11.21	10.49	1.00		0.10	92.58
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- Traffic Control Striper

Painters, Region II (South of N63 latitude)

*See per diem note on last page

S1301	Group I, including :	37.29	10.15	18.95	1.10		L&M 0.10	67.59
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- Brush
- General Painter
- Hand Taping
- Hazardous Material Handler
- Lead-Based Paint Abatement
- Roll

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Painters, Region II (South of N63 latitude)

*See per diem note on last page

S1301	Group I, including :	37.29	10.15	18.95	1.10		L&M 0.10	67.59
	Spray							
S1302	Group II, including :	38.54	10.15	18.95	1.10		L&M 0.10	68.84
	General Drywall Finisher							
	Hand/Spray Texturing							
	Machine/Automatic Taping							
	Wallpaper/Vinyl Hanger							
S1303	Group III, including :	38.64	10.15	18.95	1.10		L&M 0.10	68.94
	Bridge Painter							
	Epoxy Applicator							
	Industrial Coatings Specialist							
	Pot Tender							
	Sandblasting							
	Specialty Painter							
	Structural Steel Painter							
S1304	Group IV, including:	47.42	10.15	17.85	1.10		L&M 0.10	76.62
	Glazier							
	Storefront/Automatic Door Mechanic							
S1305	Group V, including:	39.48	10.15	5.00	1.10		L&M 0.10	55.83
	Carpet Installer							
	Floor Coverer							
	Heat Weld/Cove Base							
	Linoleum/Soft Tile Installer							
S1306	Group VI, including:	69.78	11.21	10.49	1.00		0.10	92.58
	Traffic Control Striper							

Piledrivers

*See per diem note on last page

A1401	Piledriver	50.79	8.75	16.80	0.77		L&M 0.10	IAF 77.21
	Assistant Dive Tender							
	Carpenter/Piledriver							
	Rigger							
	Sheet Stabber							

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Piledrivers
*See per diem note on last page

A1401	Piledriver	50.79	8.75	16.80	0.77	L&M	IAF	77.21
	Skiff Operator							
A1402	Piledriver-Welder/Toxic Worker	51.79	8.75	16.80	0.77	L&M	IAF	78.21
A1403	Remotely Operated Vehicle Pilot/Technician	55.10	8.75	16.80	0.77	L&M	IAF	81.52
	Single Atmosphere Suit, Bell or Submersible Pilot							
A1404	Diver (working) **See note on last page	94.90	8.75	16.80	0.77	L&M	IAF	121.32
A1405	Diver (standby) **See note on last page	55.10	8.75	16.80	0.77	L&M	IAF	81.52
A1406	Dive Tender **See note on last page	54.10	8.75	16.80	0.77	L&M	IAF	80.52
A1407	Welder (American Welding Society, Certified Welding Inspector)	56.35	8.75	16.80	0.77	L&M	IAF	82.77

Plumbers, Region I (North of N63 latitude)
*See per diem note on last page

N1501	Journeyman Pipefitter	55.66	12.95	20.20	1.75	L&M	S&L	91.76
	Plumber							
	Welder							

Plumbers, Region II (South of N63 latitude)
*See per diem note on last page

S1501	Journeyman Pipefitter	50.00	14.28	16.52	2.40	L&M		83.40
	Plumber							
	Welder							

Plumbers, Region IIA (1st Judicial District)
*See per diem note on last page

X1501	Journeyman Pipefitter	53.00	16.17	12.50	3.10	L&M		85.01
	Plumber							
	Welder							

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Power Equipment Operators

*See per diem note on last page

						L&M	
A1601	Group I, including:	53.23	12.10	16.25	1.05	0.10	82.73
	Asphalt Roller: Breakdown, Intermediate, and Finish						
	Back Filler						
	Barrier Machine (Zipper)						
	Beltcrete with Power Pack & similar conveyors						
	Bending Machine						
	Boat Coxswain						
	Bulldozer						
	Cableways, Highlines & Cablecars						
	Cleaning Machine						
	Coating Machine						
	Concrete Hydro Blaster						
	Cranes (45 tons & under or 150 feet of boom & under (including jib & attachments))						
	(a) Hydralifts or Transporters, (all track or truck type)						
	(b) Derricks						
	(c) Overhead						
	Crushers						
	Deck Winches, Double Drum						
	Ditching or Trenching Machine (16 inch or over)						
	Drag Scraper, Yarder, and similar types						
	Drilling Machines, Core, Cable, Rotary and Exploration						
	Finishing Machine Operator, Concrete Paving, Laser Screed, Sidewalk, Curb & Gutter Machine						
	Grade Checker and/or Line and Grade including Drone						
	Helicopters						
	Hover Craft, Flex Craft, Loadmaster, Air Cushion, All-Terrain Vehicle, Rollagon, Bargecable, Nodwell, & Snow Cat						
	Hydro Ax, Feller Buncher & similar						
	Hydro Excavation (Vac-Truck and Similar)						
	Loaders (2 1/2 yards through 5 yards, including all attachments):						
	(a) Forklifts (with telescopic boom & swing attachment)						
	(b) Front End & Overhead, (2-1/2 yards through 5 yards)						
	(c) Loaders, (with forks or pipe clamp)						
	(d) Loaders, (elevating belt type, Euclid & similar types)						
	Material Transfer Vehicle (Elevating Grader, Pickup Machine, and similar types)						
	Mechanic, Welder, Bodyman, Electrical, Camp & Maintenance Engineer						
	Micro Tunneling Machine						
	Mixers: Mobile type with hoist combination						
	Motor Patrol Grader						
	Mucking Machine: Mole, Tunnel Drill, Horizontal/Directional Drill Operator and/or Shield						

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Power Equipment Operators
 *See per diem note on last page

							L&M	
A1601	Group I, including:	53.23	12.10	16.25	1.05	0.10		82.73
	Off-Road Hauler (including Articulating and Haul Trucks)							
	Operator on Dredges							
	Piledriver Engineer, L.B. Foster, Puller or similar paving breaker							
	Plant Operator (Asphalt & Concrete)							
	Power Plant, Turbine Operator 200 k.w & over (power plants or combination of power units over 300 k.w.)							
	Remote Controlled Equipment							
	Scraper (through 40 yards)							
	Service Oiler/Service Engineer							
	Shot Blast Machine							
	Shovels, Backhoes, Excavators with all attachments, and Gradealls (3 yards & under)							
	Sideboom (under 45 tons)							
	Sub Grader (Gurries & similar types)							
	Tack Tractor							
	Truck Mounted Concrete Pump, Conveyor/Tele-belt, & Creter							
	Wate Kote Machine							

							L&M	
A1602	Group IA, including:	55.33	12.10	16.25	1.05	0.10		84.83
	Camera/Tool/Video Operator (Slipline)							
	Certified Welder, Electrical Mechanic, Camp Maintenance Engineer, Mechanic (over 10,000 hours)							
	Cranes (over 45 tons or 150 feet including jib & attachments)							
	(a) Clamshells & Draglines (over 3 yards)							
	(b) Tower Cranes							
	Licensed Water/Waste Water Treatment Operator							
	Loaders (over 5 yards)							
	Motor Patrol Grader, Dozer, Grade Tractor (finish: when finishing to final grade and/or to hubs, or for asphalt)							
	Power Plants (1000 k.w. & over)							
	Profiler, Reclaimer, and Roto-Mill							
	Quad							
	Scrapers (over 40 yards)							
	Screed							
	Shovels, Backhoes, Excavators with all attachments (over 3 yards)							
	Sidebooms (over 45 tons)							
	Slip Form Paver, C.M.I. & similar types							
	Topside (Asphalt Paver, Slurry machine, Spreaders, and similar types)							

							L&M	
A1603	Group II, including:	52.32	12.10	16.25	1.05	0.10		81.82
	Boiler - Fireman							

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Power Equipment Operators								
*See per diem note on last page								

A1603	Group II, including:	52.32	12.10	16.25	1.05		L&M 0.10	81.82
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- Cement Hogs & Concrete Pump Operator
- Conveyors (except those listed in Group I)
- Hoists on Steel Erection, Towermobiles & Air Tuggers
- Horizontal/Directional Drill Locator
- Locomotives, Rod & Geared Engines
- Mixers
- Screening, Washing Plant
- Sideboom (cradling rock drill, regardless of size)
- Skidder
- Trenching Machines (under 16 inches)
- Water/Waste Water Treatment Operator

A1604	Group III, including:	51.46	12.10	16.25	1.05		L&M 0.10	80.96
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- "A" Frame Trucks, Deck Winches
- Bombardier (tack or tow rig)
- Boring Machine
- Brooms, Power (sweeper, elevator, vacuum, or similar)
- Bump Cutter
- Compressor
- Farm Tractor
- Forklift, Industrial Type
- Gin Truck or Winch Truck (with poles when used for hoisting)
- Hoists, Air Tuggers, Elevators
- Loaders:
 - (a) Elevating-Athey, Barber Greene & similar types
 - (b) Forklifts or Lumber Carrier (on construction job sites)
 - (c) Forklifts, (with tower)
 - (d) Overhead & Front End, (under 2-1/2 yards)
- Locomotives: Dinkey (air, steam, gas & electric) Speeders
- Mechanics, Light Duty
- Oil, Blower Distribution
- Posthole Digger, Mechanical
- Pot Fireman (power agitated)
- Power Plant, Turbine Operator, (under 200 k.w.)
- Pumps, Water
- Roller (other than Asphalt)
- Saws, Concrete
- Skid Hustler
- Skid Steer (with all attachments)
- Stake Hopper

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Power Equipment Operators
*See per diem note on last page

A1604	Group III, including:	51.46	12.10	16.25	1.05		L&M 0.10	80.96
	Straightening Machine							
	Tow Tractor							

A1605	Group IV, including:	44.06	12.10	16.25	1.05		L&M 0.10	73.56
	Crane Assistant Engineer/Rig Oiler							
	Drill Helper							
	Parts & Equipment Coordinator							
	Spotter							
	Steam Cleaner							
	Swamper (on trenching machines or shovel type equipment)							

Roofers
*See per diem note on last page

A1701	Roofer & Waterproofer	52.07	13.90	4.01	0.81		L&M 0.10	0.09	70.98
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A1702	Roofer Material Handler	38.68	13.90	4.01	0.81		L&M 0.10	0.09	57.59
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Sheet Metal Workers, Region I (North of N63 latitude)
*See per diem note on last page

N1801	Sheet Metal Journeyman	58.73	13.45	15.94	0.17		L&M 0.12		88.41
	Brazing, soldering or welding of metals								
	Demolition of sheet metal HVAC & HVAC-R systems								
	Fabrication and installation of heating, ventilation and air conditioning ducts and equipment								
	Fabrication and installation of interior and exterior wall sheathing, siding, metal roofing, flashing, gutters, decking and architectural sheet metal work								
	Fabrication and installation of louvers and hoods								
	Fabrication and installation of sheet metal lagging								
	Fabrication and installation of stainless steel commercial or industrial food service equipment & wall sheathing								
	HVAC & HVAC-R Service Mechanic, servicing and maintaining and making operable HVAC & HVAC-R Systems								
	HVAC & HVAC-R systems controls and programming								
	Installation, inspection, testing, servicing, and maintenance of fire dampers, smoke control systems, smoke evacuation systems, and fire/smoke dampers								

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Sheet Metal Workers, Region I (North of N63 latitude)

*See per diem note on last page

							L&M	
N1801	Sheet Metal Journeyman	58.73	13.45	15.94	0.17	0.12		88.41

- Installation, servicing, and maintenance of commercial laundry systems and associated equipment
- Manufacture, fabrication assembly, installation and alteration of all ferrous and nonferrous metal work
- Metal lavatory partitions
- Preparation of drawings taken from architectural and engineering plans required for fabrication and erection of sheet metal work
- Sheet Metal shelving, lockers
- Sheet Metal venting, chimneys and breaching
- Skylight installation
- Testing, Adjusting and Balancing (TAB) of all HVAC & HVAC-R mechanical systems as well as the cleaning of those systems

Sheet Metal Workers, Region II (South of N63 latitude)

*See per diem note on last page

							L&M	
S1801	Sheet Metal Journeyman	52.08	13.45	15.30	2.08	0.43		83.34

- Brazing, soldering or welding of metals
- Demolition of sheet metal HVAC & HVAC-R systems
- Fabrication and installation of heating, ventilation and air conditioning ducts and equipment
- Fabrication and installation of interior and exterior wall sheathing, siding, metal roofing, flashing, decking and architectural sheet metal work
- Fabrication and installation of louvers and hoods
- Fabrication and installation of sheet metal lagging
- Fabrication and installation of stainless steel commercial or industrial food service equipment & wall sheathing
- HVAC & HVAC-R Service Mechanic, servicing and maintaining and making operable HVAC & HVAC-R Systems
- HVAC & HVAC-R systems controls and programming
- Installation, inspection, testing, servicing, and maintenance of fire dampers, smoke control systems, smoke evacuation systems, and fire/smoke dampers
- Installation, servicing, and maintenance of commercial laundry systems and associated equipment
- Manufacture, fabrication assembly, installation and alteration of all ferrous and nonferrous metal work
- Metal lavatory partitions
- Preparation of drawings taken from architectural and engineering plans required for fabrication and erection of sheet metal work
- Sheet Metal shelving, lockers

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other	Benefits	THR
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Sheet Metal Workers, Region II (South of N63 latitude)

*See per diem note on last page

S1801	Sheet Metal Journeyman	52.08	13.45	15.30	2.08		L&M 0.43	83.34
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Sheet Metal venting, chimneys and breaching
 Skylight installation
 Testing, Adjusting and Balancing (TAB) of all HVAC & HVAC-R mechanical systems as well as the cleaning of those systems

Sprinkler Fitters

*See per diem note on last page

A1901	Sprinkler Fitter	60.67	12.40	18.45	0.54		L&M 0.25	92.31
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Surveyors

*See per diem note on last page

A2001	Chief of Parties	59.93	13.48	14.64	1.30		L&M 0.10	89.45
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A2002	Party Chief	55.78	13.48	14.64	1.30		L&M 0.10	85.30
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A2003	Line & Grade Technician/Office Technician/GPS, Drones	52.77	13.48	14.64	1.30		L&M 0.10	82.29
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A2004	Associate Party Chief (including Instrument Person & Head Chain Person)/Stake Hop/Grademan	50.31	13.48	14.64	1.30		L&M 0.10	79.83
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A2006	Chain Person (for crews with more than 2 people)	45.29	13.48	14.64	1.30		L&M 0.10	74.81
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Truck Drivers

*See per diem note on last page

A2101	Group I, including:	51.58	13.48	14.64	1.30		L&M 0.10	81.10
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Air/Sea Traffic Controllers
 Ambulance/Fire Truck Driver (EMT certified)
 Boat Coxswain
 Captains & Pilots (air & water)
 Deltas, Commanders, Rollagons, & similar equipment (when pulling sleds, trailers or similar equipment)
 Dump Trucks (including articulating end dumps, rockbuggy, side dump, belly dump, & trucks with pups) over 40 yards up to & including 60 yards
 Fueler
 Helicopter Transporter

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Truck Drivers
 *See per diem note on last page

A2101	Group I, including:	51.58	13.48	14.64	1.30		L&M 0.10	81.10
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- Liquid Vac Truck/Super Vac Truck
- Material Coordinator or Purchasing Agent
- Oil Distributor Truck
- Ready-mix (over 12 yards up to & including 15 yards) (over 15 yards to be negotiated)
- Semi with Double Box Mixer
- Tireman, Medium Duty (Truck Tires up to 1200-24")
- Water Wagon (250 Bbls and above)

A2102	Group 1A including:	53.05	13.48	14.64	1.30		L&M 0.10	82.57
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- Dump Trucks (including rockbuggy, side dump, belly dump & trucks with pups) over 60 yards up to & including 100 yards (over 100 yards to be negotiated)
- Jeeps (driver under load)
- Lowboys, including tractor attached trailers & jeeps, up to & including 12 axles (over 12 axles or 150 tons to be negotiated)
- Tireman Heavy Duty (earthmover tires, i.e., loader, scraper, haul truck)

A2103	Group II, including:	50.12	13.48	14.64	1.30		L&M 0.10	79.64
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- All Deltas, Commanders, Rollagons, & similar equipment
- Batch Trucks (8 yards & up)
- Batch Trucks (up to & including 7 yards)
- Boom Truck/Knuckle Truck (over 5 tons)
- Cacasco Truck/Heat Stress Truck
- Construction and Material Safety Technician
- Dump Trucks (including articulating end dump, rockbuggy, side dump, belly dump, & trucks with pups) over 20 yards up to & including 40 yards
- Gin Pole Truck, Winch Truck, Wrecker (truck mounted "A" frame manufactured rating over 5 tons)
- Mechanics
- Partsman
- Ready-mix (up to & including 12 yards)
- Stringing Truck
- Turn-O-Wagon or DW-10 (not self loading)

A2104	Group III, including:	49.17	13.48	14.64	1.30		L&M 0.10	78.69
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- Boom Truck/Knuckle Truck (up to & including 5 tons)
- Dump Trucks (including articulating end dump, rockbuggy, side dump, belly dump, & trucks with pups) over 10 yards up to & including 20 yards
- Expeditor (electrical & pipefitting materials)

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Truck Drivers
 *See per diem note on last page

A2104 Group III, including:	49.17	13.48	14.64	1.30			L&M 0.10	78.69
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- Gin Pole Truck, Winch Truck, Wrecker (truck mounted "A" frame manufactured rating 5 tons & under)
- Greaser - Shop
- Semi or Truck & Trailer
- Thermal Plastic Layout Technician
- Traffic Control Technician
- Trucks/Jeeps (push or pull)

A2105 Group IV, including:	48.50	13.48	14.64	1.30			L&M 0.10	78.02
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- Air Cushion or similar type vehicle
- All Terrain Vehicle
- Buggymobile
- Bull Lift & Fork Lift, Fork Lift with Power Boom & Swing Attachment (over 5 tons)
- Bus Operator (over 30 passengers)
- Cement Spreader, Dry
- Combination Truck-Fuel & Grease
- Compactor (when pulled by rubber tired equipment)
- Dump Trucks (including rockbuggy, side dump, belly dump, & trucks with pups) up to & including 10 yards
- Dumpster
- Expeditor (general)
- Fire Truck/Ambulance Driver
- Flat Beds, Dual Rear Axle
- Foam Distributor Truck Dual Axle
- Front End Loader with Fork
- Grease Truck
- Hydro Seeder, Dual Axle
- Hyster Operators (handling bulk aggregate)
- Loadmaster (air & water operations)
- Lumber Carrier
- Ready-mix, (up to & including 7 yards)
- Rigger (air/water/oilfield)
- Tireman, Light Duty
- Track Truck Equipment
- Truck Vacuum Sweeper
- Warehouseperson
- Water Truck (Below 250 Bbls)
- Water Truck (straight)
- Water Wagon, Semi

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Truck Drivers
 *See per diem note on last page

						L&M	
A2106	Group V, including:	47.62	13.48	14.64	1.30	0.10	77.14
	Buffer Truck						
	Bull Lifts & Fork Lifts, Fork Lifts with Power Boom & Swing Attachments (up to & including 5 tons)						
	Bus Operator (up to 30 passengers)						
	Farm Type Rubber Tired Tractor (when material handling or pulling wagons on a construction project)						
	Flat Beds, Single Rear Axle						
	Foam Distributor Truck Single Axle						
	Fuel Handler (station/bulk attendant)						
	Gear/Supply Truck						
	Gravel Spreader Box Operator on Truck						
	Hydro Seeder, Single Axle						
	Pickups (pilot cars & all light-duty vehicles)						
	Rigger						
	Swamper						
	Tack Truck (welders/gear)						
	Team Drivers (horses, mules, & similar equipment)						

Tunnel Workers, Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)
 *See per diem note on last page

						L&M	LEG
N2201	Group I, including:	44.28	10.55	21.51	2.00	0.35	0.20 78.89
	Brakeman						
	Mucker						
	Nipper						
	Storm Water Pollution Protection Plan Worker (SWPPP Worker - erosion and sediment control Laborer)						
	Topman & Bull Gang						
	Tunnel Track Laborer						

						L&M	LEG
N2202	Group II, including:	45.38	10.55	21.51	2.00	0.35	0.20 79.99
	Burning & Cutting Torch						
	Certified Erosion Sediment Control Lead (CESCL Laborer)						
	Concrete Laborer						
	Floor Preparation, Core Drilling						
	Jackhammer/Chipping Gun or Pavement Breaker						
	Laser Instrument Operator						
	Nozzlemen, Pumpcrete or Shotcrete						
	Pipelayer Helper						

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Tunnel Workers, Laborers (The Alaska areas north of N63 latitude and east of W138 longitude)
 *See per diem note on last page

N2203	Group III, including:	46.37	10.55	21.51	2.00	L&M	LEG	80.98
	Miner					0.35	0.20	
	Retimberman							

N2204	Group IIIA, including:	51.18	10.55	21.51	2.00	L&M	LEG	85.79
	Asphalt Raker, Asphalt Belly Dump Lay Down							
	Drill Doctor (in the field)							
	Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)							
	Pioneer Drilling & Drilling Off Tugger (all type drills)							
	Pipelayer							
	Powderman (Employee Possessor)							
	Storm Water Pollution Protection Plan Specialist (SWPPP Specialist)							
	Traffic Control Supervisor, DOT Qualified							

N2206	Group IIIB, including:	59.41	5.50	21.51	1.60	L&M	LEG	88.57
	Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)(over 5,000 hours)							
	Federal Powderman (Responsible Person in Charge)							
	Grade Checking (setting or transferring of grade marks, line and grade, GPS, drones)							
	Pioneer Drilling & Drilling Off Tugger (all type drills)(over 5,000 hours)							
	Stake Hopper							

Tunnel Workers, Laborers (The area that is south of N63 latitude and west of W138 longitude)
 *See per diem note on last page

S2201	Group I, including:	44.28	10.55	21.51	2.00	L&M	LEG	78.89
	Brakeman							
	Mucker							
	Nipper							
	Storm Water Pollution Protection Plan Worker (SWPPP Worker - erosion and sediment control Laborer)							
	Topman & Bull Gang							
	Tunnel Track Laborer							

S2202	Group II, including:	45.38	10.55	21.51	2.00	L&M	LEG	79.99
	Burning & Cutting Torch							
	Certified Erosion Sediment Control Lead (CESCL Laborer)							
	Concrete Laborer							
	Floor Preparation, Core Drilling							

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Tunnel Workers, Laborers (The area that is south of N63 latitude and west of W138 longitude)
 *See per diem note on last page

						L&M	LEG	
S2202	Group II, including:	45.38	10.55	21.51	2.00	0.35	0.20	79.99
	Jackhammer/Chipping Gun or Pavement Breaker							
	Laser Instrument Operator							
	Nozzlemen, Pumpcrete or Shotcrete							
	Pipelayer Helper							

						L&M	LEG	
S2203	Group III, including:	46.37	10.55	21.51	2.00	0.35	0.20	80.98
	Miner							
	Retimberman							

						L&M	LEG	
S2204	Group IIIA, including:	51.18	10.55	21.51	2.00	0.35	0.20	85.79
	Asphalt Raker, Asphalt Belly Dump Lay Down							
	Drill Doctor (in the field)							
	Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)							
	Pioneer Drilling & Drilling Off Tugger (all type drills)							
	Pipelayer							
	Powderman (Employee Possessor)							
	Storm Water Pollution Protection Plan Specialist (SWPPP Specialist)							
	Traffic Control Supervisor, DOT Qualified							

						L&M	LEG	
S2206	Group IIIB, including:	59.41	5.50	21.51	1.60	0.35	0.20	88.57
	Driller (including, but not limited to wagon drills, air-track drills, hydraulic drills)(over 5,000 hours)							
	Federal Powderman (Responsible Person in Charge)							
	Grade Checking (setting or transferring of grade marks, line and grade, GPS, drones)							
	Pioneer Drilling & Drilling Off Tugger (all type drills)(over 5,000 hours)							
	Stake Hopper							

Tunnel Workers, Power Equipment Operators
 *See per diem note on last page

						L&M		
A2207	Group I	58.55	12.10	16.25	1.05	0.10		88.05
A2208	Group IA	60.86	12.10	16.25	1.05	0.10		90.36
A2209	Group II	57.55	12.10	16.25	1.05	0.10		87.05

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

Class Code	Classification of Laborers & Mechanics	BHR	H&W	PEN	TRN	Other Benefits	THR
Tunnel Workers, Power Equipment Operators							
*See per diem note on last page							
A2210	Group III	56.60	12.10	16.25	1.05	L&M 0.10	86.10
A2211	Group IV	48.47	12.10	16.25	1.05	L&M 0.10	77.97

* Per diem is an established practice for this classification. This means that per diem is an allowable alternative to board and lodging if all criteria are met. See 8 AAC 30.051-08 AAC 30.056, and the per diem information on page vii of this Pamphlet.

** Work in combination of classifications: Employees working in any combination of classifications within the diving crew (working diver, standby diver, and tender) in a shift are paid in the classification with the highest rate for a minimum of 8 hours per shift.

Wage benefits key: ANU=Annuity, BHR=basic hourly rate; H&W=health and welfare; IAF=industry advancement fund; LEG=legal fund; L&M=labor/management fund; PEN=pension fund; SAF=safety; SUI=supplemental unemployment insurance; S&L=SUI & LEG combined; TRN=training; THR=total hourly rate; VAC=vacation

PART 1 GENERAL

1.1 SCOPE: SECTION 01 10 00 - SUMMARY

- A. This section summarizes the work covered by the contract documents including the owner and contractor use of the premises.

1.2 PROJECT INFORMATION

- A. Work of this Contract comprises renovations of Fairbanks City Hall, 800 Cushman Street, Fairbanks, Alaska for the City of Fairbanks.
- B. City of Fairbanks
Jeff Whipple
907.459.6743
JWhipple@fairbanks.gov
- C. City of Fairbanks
Tim Zinza
907.459-6745
TZinza@fairbanks.gov
- D. Design Alaska
Blake Burley
907.452.1241
Blake@designalaska.com

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. Work includes, but is not limited to, demolition, general construction, site work, mechanical and electrical work, and hazardous materials abatement.
- B. The Construction is to be phased to accommodate continuous building occupancy.
- C. Work not disabling the current heating system may begin as soon as practical after proper notices and permits have been provided.
- D. Work which disables the current heating system shall commence after May 1, 2026 and the new heating system shall be active no later than September 1, 2026 or temporary heat must be provided to maintain a minimum temperature of 65 degrees F in all occupied spaces at the contractor's expense.

- E. Bidders shall familiarize themselves with the Contract Documents and existing conditions, which affect Work, required by the Contract Documents. It will be assumed that bidders have made a personal examination of the jobsite, existing conditions, and documents for prior construction projects associated with this facility made available by the Owner for review by Bidders during the bid period.
- F. Failure to visit the jobsite, to review existing conditions, or to review documents for prior construction projects associated with this facility made available by the Owner for review by Bidders during the bid period will in no way relieve the successful Bidder from the necessity of furnishing any materials or performing any Work that may be required to complete the Work in accordance with the Contract Documents with no additional cost to the Owner.
- G. For building access and for access to the documents for prior construction projects associated with this facility contact:
 - Jeff Whipple: (907) 459-6743
 - City of Fairbanks Engineering Dept.
 - 800 Cushman Street
 - Fairbanks, AK 99701

1.4 PERMITS, FEES, AND INSPECTIONS

- A. Obtain, and comply with the requirements of all permits, fees, and inspections required by public authorities including plan-check fees associated with the City of Fairbanks permit process. City of Fairbanks fees will be waived.
- B. Transmit copies of permit applications, permits received, and public authority inspection reports to the Contracting Officer within three days of making permit application or receiving permits or reports.

1.5 REFERENCE STANDARDS

- A. For products or workmanship specified by association, trade, or regulatory agency standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Obtain a copy of standards referenced. Maintain a copy at the jobsite during execution of Work to which the standard applies.
- C. The date of the standard is that in effect as of the bid date except when a specific date is specified.

1.6 WORK SEQUENCE

- A. Construct Work in zones to accommodate Owner occupancy requirements during the construction period. A zoning plan is shown in the contract documents, coordinate any proposed deviations from this plan or construction schedule and operations with Owner.
- B. City Hall will remain in operation during the heating system upgrade project.
- C. Schedule Work to comply with the requirements of the Construction Zoning Plans indicated in the contract documents.
- D. Completed Work Areas or Work Areas not yet available for construction may have to be accessed to accomplish Work associated with Work Areas currently under construction. In addition to requirements for working in Owner occupied areas stated elsewhere:
 - 1. Coordinate access with the various trades requiring access to minimize disruption of Owner activities.
 - 2. Give written notice for other than current work areas two weeks in advance of beginning Work. Include with notice a schedule of the Work requiring access.

1.7 OWNER OCCUPANCY

- A. The Owner will occupy premises during entire period of construction for the conduct of its normal operations. However, occupants will move/relocate for construction activities per Sequencing Plan Sheets A100 through A102, with the exceptions noted below.
 - 1. The IT Department in the Basement cannot be closed during regular business hours.
 - 2. The Clerk's office on the First Floor cannot be closed during regular business hours.
- B. Maintain IBC complying access to and through corridors, stairways, and building exits at all times.
- C. Cooperate with Owner to minimize conflict and to facilitate its operations. In case of conflict accept Contracting Officer's direction as final and adjust use of premises accordingly.
- D. Coordinate Work in and use of premises with the Owner.

1.8 CONTRACTOR USE OF PREMISES

- A. Limit use of premises for Work and for construction operations, to allow for Owner occupancy, Work of other Contractors, and public access.

- B. Limit areas of construction operations to those areas requiring renovation only.
- C. Limit on site storage of materials to Owner indicated staging areas. Contractor is responsible for security of stored materials.
- D. Give written notice two weeks in advance of beginning of Work in any Work area. Previous work area must be in occupiable condition prior to beginning work in another area.
- E. Do not smoke except in specifically designated smoking areas.
- F. Take reasonable and adequate precautions to protect the Owner's property from damage during execution of Work. Restore any damage to Owner property resulting from execution of Work or replace in a manner satisfactory to the Contracting Officer.
- G. Do not begin demolition of existing Work or construction of new Work in any Work area until all required construction materials for that Work area are stored on site or at Contractor's place of business.
- H. Limit construction access to building to the location indicated. Keep construction access points locked at all times. Contractor will be provided with six sets of keys for construction access points.
- I. Move Owner tools, equipment, shelving, stored materials, etc. as required to accomplish Work. Return to original location as soon as possible.
- J. Protect Owner tools, equipment, shelving, stored materials, and equipment, etc. from Work.
- K. In Owner occupied areas:
 - 1. Cover and protect from dust and debris, at the start of each work day, electronic office equipment such as personal computers, computer terminals, facsimile machines, copiers, printers, postage meters, monitors, etc. Remove protection at the end of each work day.
 - 2. Do not use furniture, such as countertops, desks, filing cabinets, book shelves, and tables as work surfaces or as steps to access Work.
 - 3. At the end of each workday, move back to original location equipment and furniture moved to accommodate Work. Do not move electronic equipment unless necessary to accomplish Work.
 - 4. At the end of each workday replace ceiling tiles removed to access Work in public areas only.
 - 5. At the end of each work day, clean work areas, including floors with a vacuum, and remove tools, equipment, and construction material from work areas.

- L. Coordinate temporary shutdowns of any of the existing facilities' mechanical or electrical systems affecting systems in Owner occupied areas with the Contracting Officer. Schedule shutdowns for nights and weekends. Provide a minimum five-day notice.
- M. Existing building systems not related to the heating system shall be fully operational for intended purpose at the beginning of each Owner workday.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 01 25 00 - SUBSTITUTION PROCEDURES

- A. This section summarizes procedures to substitute products and procedures during the course of the project.

1.2 SUBSTITUTIONS

- A. Whenever a material, article or piece of equipment is identified in the Contract Documents by reference to manufacturer's or vendor's names, trade names, catalog numbers, etc., it is intended to establish a minimum standard. Unless otherwise noted any material, article or equipment of other manufacturers or vendors which will perform adequately the duties imposed by the general design of the Project will be considered equally acceptable; provided, the material, article or equipment so proposed is, in the opinion of the Contracting Officer, of equal substance, function, dimension, appearance and quality.
- B. Prior to the bid opening, the Bidder shall make their own determination in selecting which specified or substitute equipment to base their proposal upon. Substituted items shall be equal to or better than that specified or indicated in regards to quality, workmanship, finish, space requirements, electrical requirements, performance, or warranties.
- C. After the bid opening, the Contractor shall submit sufficient data in accordance with this Section to establish equality. The Contracting Officer shall be the sole judge of equality and acceptability.
- D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Submit three copies of request for substitution on form provided by Contracting Officer.
- E. Request for substitution constitutes a representation that the Contractor:
 - 1. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.
 - 2. Will provide the same warranty for the substitution as for the specified product.
 - 3. Will coordinate installation and make other changes that may be required for Work to be complete in all respects.
 - 4. Waives claim for additional costs that may subsequently become apparent.

- F. Acceptance of substitute materials will not relieve the Contractor of the responsibility for any changes in their own work or in the work of other crafts caused by the substitution. Any additional costs resulting from substitutions are the responsibility of the Contractor.
- G. Any proposed substitution whose characteristics differ from the specified item to such an extent as to necessitate changes in the mechanical, electrical or other basic design of the Project, shall include the cost of any such changes, the design and the cost of design, which costs shall be borne by the Contractor. Determination of a substitution request will be based on the Contracting Officer's comparisons as to quality, adaptability, aesthetics, Contract amount change, if applicable, etc., between the proposed substitution and specified item.
- H. Substitutions will not be considered when they are indicated or implied on Shop Drawings or Product Data submittals without separate written request, or when acceptance will require substantial revision of Contract Documents.
- I. Only one request for substitution will be considered for each product. When substitution is not accepted, provide specified product.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

- A. This section describes procedures for contract modifications including change orders.

1.2 SUBMITTALS

- A. Submit name of the individual authorized to accept changes, and to be responsible for informing others in Contractor's employ of changes in the Work.
- B. Change Order Forms: See sample Change Order form located at the end of this section (AIA Document G701).

1.3 DOCUMENTATION OF CHANGE IN CONTRACT PRICE AND CONTRACT TIME

- A. Maintain detailed records of Work done on a Cost of the Work plus a Fee basis. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the Work.
- B. Document each quotation for a change in cost or time with sufficient data to allow evaluation of the quotation.
- C. On request, provide additional data to support computations:
 - 1. Quantities of products, labor, and equipment.
 - 2. Taxes, insurance, and bonds.
 - 3. Overhead and profit.
 - 4. Justification for any change in Contract Time.
 - 5. Credit for deletions from Contract, similarly documented.
- D. Support each claim for additional costs, and for Work done on a cost of the Work plus a Fee basis, with additional information:
 - 1. Origin and date of claim.
 - 2. Dates and times Work was performed, and by whom.
 - 3. Time records and wage rates paid.
 - 4. Invoices and receipts for products, equipment and subcontracts, similarly documented.

1.4 PRELIMINARY PROCEDURES

- A. Contracting Officer may submit a Proposal Request which includes: Detailed description of change with supplementary or revised Drawings and Specifications, the projected time for executing the change and the period of time during which the requested price will be considered valid.
- B. Contractor may initiate a change by submittal of a request to Contracting Officer describing the proposed change with a statement of the reason for the change, and the effect on Contract Price and Contract Time with full documentation.

1.5 LUMP SUM CHANGE ORDER

- A. Will be based on Proposal Request and Contractor's lump sum quotation or Contractor's request for Change Order as approved by the Contracting Officer.

1.6 UNIT PRICE CHANGE ORDER

- A. For pre-determined unit prices and quantities, Change Order will be executed on a lump sum basis.
- B. For unit costs or quantities of units of work which are not predetermined, execute Work under a Work Order. Changes in Contract Price or Contract Time will be computed as specified for Cost of the Work plus Fee via Change Order.

1.7 COST OF THE WORK CHANGE ORDER

- A. Submit itemized account and supporting data after completion of change, within time limits in Conditions of the Contract.
- B. Contracting Officer will determine the change allowable in Contract Price and Contract Time as provided in Conditions of the Contract.

1.8 EXECUTION OF CHANGE ORDERS

Contracting Officer will issue Change Orders for signatures of parties as provided in Conditions of the Contract.

1.9 CORRELATION OF CONTRACTOR SUBMITTALS

- A. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Price as shown on Change Order.
- B. Promptly revise Progress Schedules to reflect any change in Contract Time and to adjust times for other items of Work affected by the change and resubmit.
- C. Promptly enter changes in Project Record Documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

ATTACHMENT: AIA DOCUMENT G701 – 2017



AIA[®]

Document G701[®] – 2017

Change Order

PROJECT: *(name and address)*

CONTRACT INFORMATION:

Contract For:
Date:

CHANGE ORDER INFORMATION:

Change Order Number:
Date:

OWNER: *(name and address)*

ARCHITECT: *(name and address)*

CONTRACTOR: *(name and address)*

THE CONTRACT IS CHANGED AS FOLLOWS:

(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)

The original (Contract Sum) (Guaranteed Maximum Price) was \$ _____

The net change by previously authorized Change Orders \$ _____

The (Contract Sum) (Guaranteed Maximum Price) prior to this Change Order was \$ _____

The (Contract Sum) (Guaranteed Maximum Price) will be (increased) (decreased) (unchanged) by this Change Order in the amount of \$ _____

The new (Contract Sum) (Guaranteed Maximum Price), including this Change Order, will be \$ _____

The Contract Time will be (increased) (decreased) (unchanged) by () days.

The new date of Substantial Completion will be _____

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

ARCHITECT *(Firm name)*

CONTRACTOR *(Firm name)*

OWNER *(Firm name)*

SIGNATURE

SIGNATURE

SIGNATURE

PRINTED NAME AND TITLE

PRINTED NAME AND TITLE

PRINTED NAME AND TITLE

DATE

DATE

DATE

PART 1 GENERAL

1.1 SCOPE: SECTION 01 30 00 - ADMINISTRATIVE PROVISIONS

- A. This section covers administration procedures as related to this specific project including meetings, applications for payment and safety.

1.2 PRE-CONSTRUCTION MEETING

- A. Attend Owner initiated preconstruction meeting.

1.3 PROGRESS MEETINGS

- A. Attend Contracting Officer scheduled and administered Project meetings throughout progress of Work at a maximum of one week intervals to discuss Work progress, status of submittals, pending changes and substitutions, and other items affecting progress and status of Work.
- B. Make physical arrangements for meetings. Employ job superintendent to attend meetings. Instruct subcontractor representatives to attend meetings as appropriate to discuss progress and status of Work.
- C. Notify Contracting Officer a minimum of 48 hours prior to meeting of any requested agenda items.

1.4 PRE-INSTALLATION CONFERENCES

- A. When required by individual specification section, convene pre-installation conference prior to commencing work of that section.
- B. Require attendance of entities directly affecting, or affected by, work of that section.
- C. At the meeting review conditions of installation, preparation and installation procedures, and coordination with related work.

1.5 APPLICATIONS FOR PAYMENT

- A. Submit in accordance with contract provisions.
- B. Content and Format as required for Contracting Officer.

1.6 SAFETY

- A. Comply with all Federal and State regulations concerning safety of personnel and equipment.

1.7 FIRE-SAFETY

- A. Maintain the project site, to reduce hazards from fire. Provide protective equipment or fire watch personnel as needed to support the project.

1.8 CORRECTION PERIOD

- A. If within 18 months after the date of Final Completion or such longer period of time as may be prescribed by Regulatory Requirements or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work, materials, or products are found to be defective, the Contractor shall promptly, without cost to the Owner and in accordance with the Contracting Officer's written instructions, either correct such defective Work, or, if it has been rejected by the Contracting Officer, remove it from the site and replace it with conforming Work.
- B. If the Contractor does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, the Owner may have the defective Work corrected or the rejected Work removed and replaced, and all direct, indirect, and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals) will be paid by the Contractor.
- C. In special circumstances where a particular item of equipment is placed in continuous service for the benefit of the Owner before Substantial Completion of all the Work, the correction period for that item may begin on an earlier date if so provided in the Specifications of by Change Order.
- D. Provisions of this paragraph are not intended to shorten the statute of limitations for bringing an action.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 01 33 00 – SUBMITTAL PROCEDURES

- A. This section covers submittal procedures including submittal register, products and schedule of values.

1.2 PROCEDURES

- A. Deliver submittals to Contracting Officer as directed under Contracting Officer accepted form.
- B. Transmit submittals in accordance with approved Construction Progress Schedule, Submittal Register, and in such sequence to avoid delay in the Work or Work of other Contracts.
- C. 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.
- D. Coordinate submittals with requirements of Work and of Contract Documents.
- E. After Contracting Officer review of submittal, revise and resubmit as required, identifying changes made since previous submittal.
- F. Distribute copies of reviewed submittals to concerned persons including one set to field office. Instruct recipients to promptly report any inability to comply with provisions.
- G. Make resubmittals under procedures specified for initial submittals; identify changes made since previous submittal.
- H. Acceptance of schedules, Shop Drawings, Product Data, or samples by the Owner or their representative in no way relieves the Contractor of obligation to perform Work in accordance with requirements of the Contract Documents.

1.3 SUBMITTAL REGISTER

- A. Submit Submittal Register. Attached is a Register to use as the basis of the Register submitted. The Register attached is not necessarily complete. Add items as required to provide a complete Submittal Register. Complete Contractor planned Submit Date column. No other form of Register will be accepted.
- B. Other submittals will not be accepted for review until a submittal register acceptable to the Project Manager has been received by the Project Manager.

1.4 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial progress schedules not more than 21 days after Contract award.
- B. Prepare schedule to comply with the requirements of the Construction Phasing Matrix.
- C. The progress schedule must be approved by the Contracting Officer before any Application for Payment will be processed by the Contracting Officer.
- D. Prepare Project construction schedules using computer-based project scheduling software specifically adapted for construction projects with Gantt Chart outputs.
- E. Include complete listing of construction activities and chronological sequence for completion of each task.
 - 1. List Work in CSI format by specification section. Subdivide Work within each Section by subcontract or operation. Include procurement and delivery of major materials.
 - 2. Include inspection required by the Contract Documents and public authorities, submittals required by public authorities, utility outages, and relevant Owner activities.
 - 3. Include clearance testing of hazardous materials control areas.
 - 4. Subdivide schedules into phases of construction, showing dates of substantial and final completion for each phase.
 - 5. Show interrelationship of dependent activities.
- F. Submit updated progress schedules monthly with each Application for Payment.
 - 1. Reflect changes since previous submittal.
 - 2. Indicate progress of each activity to date of submission.
 - 3. Provide narrative identifying:
 - a. Problem areas, anticipated delays, and impact on schedule.
 - b. Corrective action recommended and its effect.

1.5 SCHEDULE OF VALUES

- A. Submit Schedule of Values a minimum of 21 days prior to submitting first application for payment. Use Owner accepted form.
- B. Provide with line item break down matching the line items on the Construction Progress Schedule.

- C. Prepare a schedule that provides a total sum of line item values equal to the total contract amount. Include in each line item a directly proportional amount of Contractor's overhead and profit.
- D. Provide substantiating information justifying information provided when requested.
- E. Do not revise value attributed to each category once the Contracting Officer accepts the Schedule of Values.
- F. Revise schedule to list change orders, for each application for payment.

1.6 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

- A. General:
 - 1. Submit one electronic copy (PDF format) of the review submittal or resubmittal for review and acceptance by the Contracting Officer, for each submittal group. Electronically Index (Bookmark) each section and item within the electronic submittal.
 - 2. Submittals are required for all materials of construction and equipment specified and indicated on the Drawings.
 - 3. Coordinate submittals into logical groupings to facilitate interrelation of the several items:
 - a. Interior finishes which involve Contracting Officer selection of colors, textures, or patterns. No selections will be made until all interior materials requiring color, texture, or pattern selection have been submitted.
 - b. Exterior finishes which involve Contracting Officer selection of colors, textures, or patterns. No selections will be made until all exterior materials requiring color, texture, or pattern selection have been submitted.
 - c. Associated items, which require correlation for efficient function or for installation.
 - d. Divisions 02 through 49 (excluding Divisions listed below): Group items by specification section. Submit items covered by a common specification section simultaneously.
 - e. Divisions 21, 22, and 23: Submit all Division items simultaneously unless otherwise indicated. See Division 23 for additional details.
 - 1) Submit Sections 23 09 23 and 23 09 93 Controls as a separate group from the remainder of Division 23.

4. The Contracting Officer will consider expedited review of required submittals. Submit a list of items for which expedited reviews are requested at the preconstruction conference. Substantiate each request by reference to the Project schedule. The Contracting Officer will be the sole judge as to whether or not expedited reviews are warranted.
 5. Apply Contractor's stamp, signed or initialed, certifying to review, verification of products, field dimensions and field construction criteria, and coordination of information with requirements of Work and Contract Documents. Notify Contracting Officer in writing at time of submittal of any deviations from requirements of Contract Documents. Note deviation on Item Data Sheet.
 6. Precede each item with a completed Item Data Sheet. See required format attached to the end of this Specification Section.
 7. Identify each item with an item number matching the item number for that item listed in the Submittal Schedule and Shop Drawing Record. Separate each item by divider sheets with plastic index tabs between each item. Type item numbers on both sides of paper inserts.
 8. Each submittal or resubmittal shall be complete and shall contain all previously submitted material except that being replaced by new or revised material, which shall be removed. Partial or improperly indexed or tabbed submittals or resubmittals shall be rejected without review or comment.
 9. With each resubmittal include a complete summary of all changes and additions made to the equipment review submittal since the previous submittal. Only those items included in the summary will be reviewed with the resubmitted package.
 10. Do not submit "updates" for previous submittal packages with resubmittals. Previous submittals will not be updated.
 11. (Suggest cleaning up above Paragraph to read: Do not submit separate "updates" for previous submittal packages with resubmittals. Group resubmittals grouped by same requirements as original submittal.)
 12. A list of minimum submittals required is provided in each Section. These lists are not necessarily complete or all-inclusive and the Contractor is responsible for complete submittal.
 13. See Mechanical and Electrical Divisions for additional submittal requirements, which affect those Divisions.
- B. Shop Drawings:
1. Present in a clear and thorough manner. Label each Drawing with Owner Project name and Project number. Identify each element of Drawings by reference to sheet number and detail, schedule, or room number of Contract Documents.

2. Identify field dimensions; show relation to adjacent or critical features or Work or products.
 3. Minimum Sheet Size: 11 inches by 17 inches.
- C. Product Data:
1. Submit only pages that are pertinent; mark each copy of standard printed data to identify pertinent products, referenced to Specification Section and Article number. Show reference standards, performance characteristics, and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions; and required clearances.
 2. 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.
- D. Samples:
1. Submit full range of manufacturers' standard colors, textures, and patterns except when more restrictive requirements are specified.
 2. Submit samples to illustrate functional characteristics of the product, with integral parts and attachment devices.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

ATTACHMENT: ITEM DATA SHEET

ITEM DATA SHEET

1. Item Name/Drawing Equipment Number:

2. Specification Section/Drawing Number:

3. Manufacturer/Model Number:

4. Size/Capacity:

5. Use And Location: (a)

6. Spare Parts Source:

7. Providers Of Warranty Service:

8. Proposed Deviations From The Contract Documents: (b)

9. Other Contractor Comments:

(a) For most sections of the specifications this information need only be provided when the product's use and location is not obvious. This information must be provided for all items provided under Specification Sections 12 13 00 and 23 09 23.

(b) If this section is left blank it will be assumed that proposed equipment is exactly as specified and indicated on the drawings.

PART 1 GENERAL

1.1 SCOPE: SECTION 01 35 43 - ENVIRONMENTAL PROTECTION

- A. This section covers procedures for environmental protection including Storm Water protection.

1.2 SUBMITTALS

- A. Submit the following to the Contracting Officer prior to (15) days before commencement of Work:
 - 1. Environmental Protection Plan (EPP).

1.3 ENVIRONMENTAL REFERENCES

- A. Environmental related work is indicated in the following sections for this project.
 - 1. For hazardous material awareness see Specification 02 41 19 Selective Demolition.
 - 2. For hazardous materials see Specifications 02 26 00, 02 82 33, and 02 83 34.

1.4 ENVIRONMENTAL PROTECTION PLAN (EPP)

- A. The EPP is the Contractor's plan for the containment, clean-up, and disposal of waste material, as well as petroleum or other hazardous substances generated by construction equipment or activities. Include in the EPP a list of quantities and types of equipment and materials available on site to be used for hazardous substance containment and clean-up.

1.5 ENVIRONMENTAL PROTECTION

- A. Prevent environmental pollution resulting from Work within and outside project boundaries.
 - 1. Environmental pollution is defined as the presence of solid waste; noise; or chemical, physical, or biological elements or agents; which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic and recreational purposes.
- B. Preserve land resources in the condition existing at the start of Work. If disturbed, restore land resources to match original conditions.

- C. Contain, clean-up, and dispose of discharges of petroleum fuels, oil, and other substances hazardous to the environment. Comply with 18 AAC 75 and Title 46 of the Alaska Statutes.
- D. Maintain general job site awareness of hazardous materials to workers and the environment throughout the work. Report suspect construction materials to Contracting Officer if observed.
- E. Stabilize excavations, embankments, stockpiles, and other work areas within and outside the project boundaries as required to prevent production of dust which causes a hazard or nuisance to others. If stabilization is provided by sprinkling dust producing areas with water, repeat at intervals required to always keep disturbed areas at least damp.
- F. Burning: Not permitted.

1.6 NOTIFICATION

- A. Provide the Contracting Officer with copies of periodic site inspection reports required by other sections.
- B. Notify immediately the Contracting Officer and the State of Alaska Department of Environmental Conservation in the event of any spills or discharges of petroleum products or other hazardous substances.
- C. Provide Contracting Officer with any notifications of non-compliance given to the Contractor.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 01 42 16 - DEFINITIONS

- A. Explanation of terminology used within the Drawings and Specifications.

1.2 SPECIFICATION FORMAT AND COMPOSITION

- A. Specifications are divided into Divisions and Sections for the convenience of writing and using. Titles are not intended to imply a particular meaning or to fully describe the Work of each Division or Section and are not an integral part of the text that specifies the requirements. Contracting Officer is not bound to define the limits of any subcontract and will not enter into disputes between the Contractor and their employees, including subcontractors.
- B. Pages are numbered independently for each Section. Section number is shown with the page number at the bottom of each page. "End of Section" is noted on the last page of each Section. It is Contractor's responsibility to verify that Contract Documents received for bidding and construction are complete in accordance with Table of Contents.
- C. These Specifications are of the abbreviated, or "streamlined" type, and include incomplete sentences.
- D. Omissions of words or phrases such as "the Contractor shall," "in conformity therewith," "shall be," "as noted on the Drawings," "according to the Drawings," "a," "an," "the" and "all" are intentional.
- E. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the Drawings.

1.3 DRAWINGS: CONTENT EXPLANATION

- 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, 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. No scale measurements shall be used as a dimension.
- E. Provide piping, ductwork, equipment, and accessories indicated on the Drawings unless it is specifically indicated that the piping, ductwork, equipment, or accessory is existing.
- F. Unless otherwise indicated, abbreviations and symbols used in the Drawings and Specifications are intended to have the meaning commonly accepted in the construction industry. Contact the Contracting Officer for definition if any question arises concerning them.
- G. Certain items used generally throughout the Specifications and Drawings are used as follows:
 - 1. Indicated: The term "indicated" is a cross reference to details, notes or schedules on the Drawings, other paragraphs or schedules in the Specifications, and similar means of recording requirements in the Contract Documents. Where terms such as "shown", "noted", "schedules", and "specified" are used in lieu of "indicate", 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 Contractor, their subcontractor or sub-subcontractor for the performance of a particular unit of 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. Provide: Except to the extent further defined, the term "provide" means to supply and install, complete and ready for the intended use.
 - 4. Furnish: Except as otherwise defined in greater detail, the term "furnish" is used to mean the same as "provide".
 - 5. Guarantee and Warranty: "Warranty" is generally used in conjunction with products manufactured or fabricated away from the Project site, and "guarantee" is generally used in conjunction with units of work which require both products and substantial amounts of labor at the Project site. The resulting difference is that warranties are frequently issued by manufacturers, and guarantees are generally issued by Contractor and frequently supported (partially) by product warranties from manufacturers.
 - 6. Work: Work is the act of, and the result of, performing services, furnishing labor, furnishing, and incorporating materials and equipment into the Project and performing other duties and obligations, all as required by the Contract Documents. Such Work, however incremental, shall culminate in the entire completed Project, or the various separately identifiable parts thereof.

7. Owner: As defined in the agreement of the project, which includes the owners designated representatives to bind the owner.
8. Contracting Officer: Contracting Officer means Owners Representative that is responsible for the administrative portions of the project.
9. Contractor: As defined in the agreement as the performer of the work.
10. Architect: As defined in in the agreement as the administrator of the contract and for the owner as defined in the contract documents.

1.4 CONFLICTS

- A. Report any conflicts to Contracting Officer for clarification.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 01 45 00 - QUALITY CONTROL

- A. This section covers quality control plan and procedures.

1.2 SUBMITTALS

- A. Testing laboratory name, address, and telephone number.
- B. Evidence of testing laboratory's authorization to operate in the State of Alaska.
- C. Name, registration, address, and telephone number of registered engineer employed by testing agency to review services provided by testing agency.

1.3 QUALITY CONTROL, GENERAL

- A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce Work of specified quality.

1.4 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 with positive anchorage devices designed and sized to withstand stresses, vibration, and racking and to minimize the transfer of sound and vibration.
- D. Provide finishes to match approved samples.

1.5 MANUFACTURERS' INSTRUCTIONS

- A. Comply with instructions in full detail, including each step in sequence. Provide accessories recommended by manufacturer for service intended and accessories indicated. Should instructions conflict with Contract Documents, request clarification from Contracting Officer before proceeding.

1.6 CONSTRUCTION PHOTOGRAPHS

- A. Take photographs of construction throughout progress of construction. At a minimum, take (12) photographs of construction at end of each work week.
- B. During each phase of construction, also take photographs providing full coverage of the following elements of construction at the beginning and completion of that element of construction.
 - 1. Demolition.
 - 2. Excavations.
 - 3. Mechanical rough-ins.
 - 4. Electrical rough-ins.
 - 5. Final completion.
- C. Deliver photographs taken since previous Application for Payment to the Contracting Officer with subsequent Application for Payment.
- D. Deliver photo to the Contracting Officer with Record Documents. Catalog and index files in chronological sequence.

1.7 CODES, ORDINANCES, AND STANDARDS

- A. Federal, State and Local Codes and Ordinances take precedence over these Specifications and Drawings where conflicts occur unless the Drawings or Specifications call for more stringent requirements. Notify the Contracting Officer in writing of conflicts.
- B. Follow latest adopted editions of Code of Federal Regulations, Alaska Administrative Code, International Building Code, International Mechanical Code, Uniform Plumbing Code, International Fire Code, National Electrical Code, ADA Accessibility Guidelines, NFPA, ASME, NEMA, ASHRAE, SMACNA, etc. as applicable.
- C. Comply with all applicable laws, building and construction codes, OSHA Safety and Health Regulations and applicable requirements of any governmental agency under whose jurisdiction this Work is being performed.

1.8 AUTHORITY HAVING JURISDICTION PERMITS AND INSPECTIONS

- A. The Authority Having Jurisdiction (AHJ) and public authorities for this project is as follows:
1. City of Fairbanks
Building Department, City Hall
800 Cushman Street
Fairbanks, AK 99701
(907) 459-6270
 2. Alaska Department of Environmental Conservation
610 University Ave
Fairbanks, AK 99709
- B. Apply for and obtain a plan review and permits for the project in accordance with AHJ policies and procedures. City of Fairbanks will waive permit fees.
- C. Obtain all required inspections by the AHJ. Schedule all inspections with AHJ and provide information to the owner. Inform owner immediately if inspection is rescheduled. Provide copies of all inspection reports and follow-up items. Provide support and assistance for all AHJ inspections.
- D. Post all permits on jobsite in a location which can be observed by AHJ when entering the job site. Keep plan reviewed, signed, construction drawings and specifications available for the AHJ use when inspecting the site.

1.9 OWNER INSPECTION SERVICES

- A. The Owner will periodically inspect the Work. Provide assistance to inspection personnel required for complete and thorough inspections.
- B. Submit written requests for inspections and testing by the Owner at the following stages of construction and at stages specified elsewhere:
1. At completion of demolition Work.
 2. At completion of buried Work, while Work is under test and before backfill.
 3. At completion of mechanical and electrical rough-in installations and before rough-ins are concealed.
 4. Substantial completion inspection.
 5. Final inspection.
- C. Inspection of Work or the witnessing of testing of Work by the Owner or their representative in no way relieves the Contractor of obligation to perform Work in accordance with requirements of the Contract Documents.

- D. Request shall identify the Project, Project No., its location, the Contractor, and a contact person and describe the nature of the desired test or inspection.
- E. If the request is for testing or inspection of Work previously tested or inspected, include the Owner's prior listing of deficiencies accompanied by the remedies provided since the prior test or inspection.
- F. Provide a minimum of (3) working days' notice to Contracting Officer and public authorities prior to performing testing of Work. The Contracting Officer or their representative will not necessarily witness testing.
 - 1. Record the performance of tests.
 - 2. Include date, time and time interval, test results, brief description of method of tests, and witnesses.
 - 3. Submit this record to the Contracting Officer prior to scheduling substantial completion and final inspections.
- G. Provide minimum of 14 calendar days written notice to Contracting Officer and public authorities of intent to have Work ready for inspection. Confirm that Work will be ready for inspection a minimum of (3) working days' notice prior to date of inspection.
- H. Substantial Completion and Final Inspections:
 - 1. Prior to inspection:
 - a. Deliver to the Contracting Officer required equipment, Drawings, and records.
 - b. Clean fixtures and equipment. Remove manufacturer's stickers and leave free of dust and dirt.
 - c. Remove boxes, scrap, and other debris.
 - d. Touch up holidays or damaged painted surfaces.
 - e. Contractor's Superintendent shall review Work for conformance with Contract Documents and develop a list of items not conforming to the Contract Documents. Correct Work identified as not conforming to the Contract Documents. With request for inspection, Contractor's Superintendent shall verify in writing that this review has been performed, that the Work conforms with the Contract Documents, and submit their original list of items not conforming to the Contract Documents, annotated with corrective action taken to resolve each deficiency noted.

- f. Deliver to Owner personnel all special tools and devices furnished by the manufacturer with items, specialties or equipment to allow installation, disassembly, adjustment, repair, or maintenance. Identify special tools or devices as to items to which it is applicable.
 - g. Deliver to the Contracting Officer a Certificate of Instruction signed by all Owner personnel receiving instruction, all Contractor personnel providing instruction, and indicating dates of instruction.
2. During inspection:
- a. Provide complete and operating systems suitable for the season.
 - b. Demonstrate that mechanical and electrical systems perform in accordance with the Contract Documents. Provide material and personnel required to perform the demonstration.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

- A. This section covers temporary facilities and controls related to the scope of work.

1.2 TEMPORARY UTILITIES, GENERAL

- A. During construction and until Work is accepted as substantially complete by the Owner, provide utility services and connections necessary for construction, inspection, and testing.
- B. The Contractor is responsible for damage or harm to material, equipment, Work, personnel, etc. that might result from use of temporary utilities.
- C. When use of Owner facilities are authorized, the Owner makes no guarantee as to sources, availability, adequacy, or interruptions of service of utilities during performance of Contract. Systems or parts of systems utilized shall be complete in all respects prior to consideration of use. Provide barriers and warning labels on energized equipment. Prevent interference with Owner's normal operation. Maintain systems during construction and return the systems to like new condition prior to substantial completion and final inspections.
- D. The facility's new and existing utility systems may be utilized. Owner will pay utility costs for normal construction operations during the construction period. Temporary heating outside of the specified construction period will be at the contractor's expense.
- E. Existing electricity and lighting may be used for construction activities with cost paid by the owner.

1.3 HEAT

- A. If construction activities extend beyond the contractually designated period of performance provide temporary equipment of sufficient number and size to maintain the temperature in Owner occupied areas at a minimum temperature of 65 degrees F
- B. Non-vented or open flame heating/ventilating equipment are not permitted.
- C. Electric heaters are not permitted.

1.4 SANITARY FACILITIES

- A. Existing Owner designated facilities may be used during construction operations; maintain in sanitary condition. Replace Contractor personnel damaged fixtures, equipment, or finishes.

1.5 BARRIERS

- A. Provide as required to prevent public entry to construction areas, to provide for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide 6-foot-high fence around staging areas; equip with vehicular and pedestrian gates with locks.
 - 1. Construction: Commercial grade portable chain link fence. At areas with existing asphalt pavement, provide posts with bases that do not require penetration of the existing asphalt pavement for support.
- C. Provide barricades and covered walkways as required by governing authorities for public rights-of-way and for public access to existing building.
- D. Except at existing trees and plants that are specifically indicated to be removed, provide barriers to preserve and protect existing trees and plants. Protect against vehicular traffic, stored materials, dumping, chemically injurious materials, and puddling or continuous running water. Roots and branches of trees and plants that are deemed to interfere with construction operations may be removed by a qualified tree surgeon; treat cuts appropriately.
- E. Remove barriers, including any subsurface features, when construction has progressed to the point that they are no longer needed as determined by the Contracting Officer. Clean and repair damage to site caused by installation of barriers. Fill and grade site to original or indicated elevations and slopes.

1.6 ENCLOSURES

- A. Provide temporary, insulated, weather-tight closures of openings in exterior surfaces to provide acceptable working conditions and protection for materials, to allow for temporary heating, and to prevent entry of unauthorized persons. Provide doors with self-closing hardware and locks.
- B. Provide temporary partitions and ceilings as required to separate work areas from Owner occupied areas, to prevent penetration of dust, moisture, and fumes into Owner occupied areas, to prevent damage to existing areas and equipment, and as required to maintain safe, emergency egress from Owner occupied areas.
- C. Construct temporary closures, partitions, and ceilings from framing and sheet materials with closed joints and sealed edges at intersections with existing surfaces.
- D. Construct temporary closures, partitions, and ceilings adjoining Owner occupied areas as required to obtain an STC rating of 40.
- E. Construct temporary closures, partitions, and ceilings from non-combustible materials. Paint surfaces exposed to view in Owner occupied areas.

- F. Remove temporary closures, partitions, and ceilings when construction needs can be met by use of permanent construction. Clean and repair damage to permanent facilities caused by installation or use of temporary closures, partitions, and ceilings.

1.7 PROTECTION OF INSTALLED WORK

- A. Provide temporary protection for installed products. Control traffic in immediate area to minimize damage.
- B. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings. Protect finished floors and stairs from traffic, movement of heavy objects, and storage.
- C. Prohibit traffic and storage on waterproofed and roofed surfaces, on lawn and landscaped areas.

1.8 SECURITY

- A. Provide security program and facilities to protect Work and Owner's operations and facilities from unauthorized entry, vandalism, and theft. Coordinate with Owner's security program.

1.9 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water.
- B. Rough grade site to prevent standing water and to direct surface drainage away from excavations, trenches, adjoining properties, and public rights-of-way.
- C. Maintain excavations and trenches free of water. Comply with all local, state, and federal dewatering requirements if pumping equipment is required in order to maintain water-free excavations.

1.10 CLEANING DURING CONSTRUCTION

- A. Control accumulation of waste materials and rubbish; periodically dispose of off-site.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to closing space.
- C. Clean interior areas prior to start of finish work, maintain areas free of dust and other contaminants during finishing operations.

1.11 PROJECT IDENTIFICATION

- A. Provide 4 feet by 8 feet project identification sign of new wood frame and 3/4-inch exterior grade plywood with medium density overlay construction. Prime and paint all surfaces with two coats of exterior quality paint. Lettered by professional sign painter using exterior quality paint. Colors selected by Contracting Officer.
- B. Content: Project title, names of Owner, Architect /Engineer and professional consultants, and Contractor and major subcontractors.
- C. Erect at location established by Contracting Officer within 30 days of Contract award.
- D. Install sign surface plumb and level, with butt joints. Anchor securely to resist wind loading.
- E. Allow no other signs to be displayed.
- F. Maintain signs and supports. Clean periodically. Repair deterioration and damages.
- G. Remove sign, including supports and subsurface features, at project completion. Clean and repair damage to site caused by installation of sign. Fill and grade site to original or indicated elevations and slopes.

1.12 FIELD OFFICES AND SHEDS

- A. A construction field office for use by Contractor personnel will be provided within City Hall for contractor use. Equip office with a desk, chair, drawing layout table, and racks and files for Record Documents, Contract Documents, and submittals.

1.13 SITE RESTORATION

- A. Remove project identification sign, field office and shed, and other construction facilities, including subsurface features, at Project completion.
- B. Return to original condition those portions of the site affected by construction operations not otherwise restored by the Work. Remove debris. Fill and grade to original elevations and slopes. Restore topsoil. Reseed with grass seed mix suitable for location.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 01 60 00 - PRODUCT REQUIREMENTS

- A. This section covers product requirement, transportation and storage of materials.

1.2 PRODUCTS

- A. Products include material, equipment, and systems.
- B. Comply with Specifications and referenced standards as minimum requirements.
- C. Components required to be supplied in quantity within a Specification Section shall be the same, and shall be interchangeable.
- D. Do not use materials and equipment removed from existing structure, except as specifically required, or allowed, by Contract Documents.
- E. Provide products and systems that do not contain asbestos or asbestos-containing materials.

1.3 TRANSPORTATION AND HANDLING

- A. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
- C. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

1.4 STORAGE AND PROTECTION

- A. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.
- B. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

- C. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.
- D. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions.

1.5 PRODUCT OPTIONS

- A. Products specified by reference standards or by description only: Use any product meeting those standards.
- B. Products specified by naming one or more manufacturers followed by the term "No Substitutions": Use only specified manufacturers, no substitutions allowed.
- C. Products specified by naming one or more manufacturers followed by the term "or equal": Submit a request for substitution for any manufacturer not specifically named.
- D. When only one product manufacturer is specified, it is intended only to establish the level of quality against which the proposed substitutions shall be judged, and shall not be construed as attempting to limit competition.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 01 70 00 - CLOSEOUT REQUIREMENTS

- A. This section covers contract closeout requirements, operation and maintenance manual, warranties, spare parts and maintenance, and systems demonstrations.

1.2 CLOSEOUT PROCEDURES

- A. Comply with procedures stated in General Conditions of the Contract for issuance of Certificate of Substantial Completion.
- B. Owner will occupy Project for the purpose of conducting business under provision stated in Certificate of Substantial Completion.
- C. When Contractor considers Work to be substantially complete, submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Owner inspection.
- D. Substantial Completion is obtained when the Work has progressed to the point where, in the opinion of the Owner, the Work is sufficiently complete in accordance with the Contract Documents so that the Work can be utilized for the purposes for which is was intended. Irrespective of other Work, Substantial Completion cannot be obtained until electrical, detection, mechanical, and life-safety systems are in place, balanced, and tested for proper operation. When the Contractor, by written notice to the Owner, certifies that the Work is substantially complete, the Owner and its representatives, within a reasonable time, will conduct an inspection to determine the actual status of completion. When the Owner, on basis of said inspection, determines that the Work is substantially complete, the Contractor will be so notified and a list of deficiencies, to be corrected or completed by the Contractor, will be attached to said notice. 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.
- E. In addition to submittals required by the conditions of the Contract, provide submittals required by governing authorities, and submit a final statement of accounting giving total adjusted Contract Price, previous payments, and sum remaining due.
- F. Owner will issue a final Change Order reflecting approved adjustments to Contract Price not previously made by Change Order.

1.3 FINAL CLEANING

- A. Execute prior to substantial completion.
- B. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Clean roofs, gutters, downspouts, and drainage systems.
- C. Clean site: sweep paved areas, rake clean other surfaces.

1.4 PROJECT RECORD DOCUMENTS

- A. Maintain one record copy of:
 - 1. Contract Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Design Clarifications (DCVRs).
 - 5. Change Orders and other modifications to the Contract.
 - 6. Reviewed Shop Drawings, Product Data, and Samples.
 - 7. Survey and field records
 - 8. Field test records.
 - 9. Inspection certificates.
 - 10. Manufacturer's certificates.
 - 11. Construction photographs.
- B. Store Record Documents and samples in clean, dry, and legible condition in Field Office apart from documents used for construction.
- C. Keep Record Documents and samples available for inspection by Contracting Officer.
- D. Record actual construction information on a set of Construction Document Drawings.
- E. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.

- F. Legibly mark Contract Drawings and Shop Drawings to record actual construction, including:
 - 1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
 - 3. Field changes of dimension and detail.
 - 4. Changes made by Addenda.
 - 5. Changes made by Modifications.
 - 6. Details not on original Contract Drawings.
 - 7. References to related shop drawings and Modifications.
- G. Legibly mark Contract Specifications to record actual construction, including:
 - 1. Manufacturer, trade name, and catalog number of each product actually installed, particularly optional items and substitute items.
 - 2. Changes made by Addenda and Modifications.
- H. Upon request by the Contracting Officer submit complete collection of Record Documents to the Contracting Officer for review and duplication as desired.
- I. Prior to request for final inspection, submit record documents to the Contracting Officer for review. Documents shall bear a statement signed by a legal representative of the Contractor indicating that the Record Documents reflect "as-built" conditions. Correct and resubmit to Contracting Officer until Contracting Officer accepts the Record Documents as complete.
- J. At Contract closeout, deliver corrected Record Documents to the Contracting Officer. Contracting Officer shall modify the CAD files as necessary to correctly show all features of the Project by bringing the CAD files into agreement with the approved preliminary as-built prints. Upon completion, the Record Drawing set shall be delivered to the Contractor on full-size paper prints, together with the preliminary as-built marked prints. The Contractor legal representative shall approve the Record Drawings by signing the drawing stamp indicating that the Record Documents reflect "as-built" conditions.

1.5 OPERATION AND MAINTENANCE DATA

A. Review Submittals and Timing:

1. Submit for review (2) copies plus the number required by the Contractor, identical copies of the Operations and Maintenance Manuals for review and acceptance by the Contracting Officer. The Contracting Officer will retain (1) copy for reference and the additional reviewed copy will be returned to the Contractor.
2. Submit (1) electronic copy of the Operation and Maintenance Manuals for review and acceptance by the Contracting Officer.
3. Submit for review not less than 30 days prior to Substantial Completion Inspection.

B. Final Operation and Maintenance Manuals:

1. Provide (5) hard copies of the complete, reviewed, corrected and accepted Operation and Maintenance Manuals to the Contracting Officer
2. Provide an electronic copy of the accepted Operation and Maintenance Manuals to the Contracting Officer.
3. Provide a minimum of 5 working days prior to Project Substantial Completion Inspection and 5 working days prior to any scheduled training on equipment.

C. Provide data in separate volumes for:

1. Architectural materials and finishes. Include:
 - 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 Specifications sections.

2. Mechanical equipment:
 - a. Provide data for all items, equipment, and equipment components specified or indicated, so that the Owner's maintenance personnel will have complete service and replacement information required for routine maintenance and repair and to provide maximum usable life. Include data not only for maintainable and repairable items, but also for replaceable but not repairable items.
 - b. Names and addresses of the suppliers from which the equipment was obtained.
 - c. For additional requirements see Division 20.
3. Electrical equipment:
 - a. Manufacturer's repair manuals, including complete listings of repair and replacement parts for all equipment.
 - b. Names and addresses of the suppliers from which the equipment was obtained.
 - c. Complete listing of all equipment which may require periodic servicing, with recommended schedules and complete instructions for performing said servicing.
 - d. For additional requirements see Division 26.
- D. General Form:
 1. Identify each item of the O&M Manual with an item number. Number the first item within a Specification section "#1", the second item within a Specification section "#2", and so forth. Restart numbering sequence with each Specification section. Further separate sections by divider sheets with plastic index tabs between each item. Type item numbers on both sides of paper inserts.
 2. Include equipment indicated on the Drawings, but not covered by a Specification section, with the appropriate volume under a tab marked "Drawings". Rules for item numbering and item data sheets apply.
 3. Provide an alphabetical index at the front of the binder that locates individual items by tab number.
 4. Precede each item by a copy of the item data sheet attached at the end of specification section 01 33 00.
 5. Material included shall indicate the specific item(s) utilized for this project. Delete or cross out all other items.

6. All material must be clearly readable. "Faxed" then photocopied information is not acceptable.
 7. Provide complete operation and maintenance manual submittals. Partial or incomplete submittals required under this section will be returned without review.
 8. Provide copies of warranties combined with the rest of the data provided for the equipment warrantied.
- E. Hard Copy Form:
1. Organize by specification section. Separate each section by a heavy stock divider sheet with plastic index tab. Type Specification section numbers on both sides of paper inserts.
 2. Separate each item with consecutively numbered heavy stock divider sheets with plastic index tab. Type item number on both sides of paper inserts.
 3. Bind the Operation and Maintenance Manuals in three-ring, D-ring style binders with page lifters and vinyl covers. Expandable catalog type two-hole binders with soft board covers and metal prong fasteners will not be accepted.
 4. Provide multiple binders as required to limit single binder thickness to 3 inches. Divide binders at logical points. Do not overfill binders.
 5. Label the front cover and end panel. Label to include Project title, Project number, date, and facility name.
- F. Electronic Form:
1. Provide in PDF file format, current version. Provide a single file for each volume.
 2. Electronically Index (Bookmark) each section and item, by item data number and name within the electronic submittal.
 3. Provide digital copies on Compact Disc (CD) or USB compatible memory card (Flash Drive). Review submittals may be by file transfer or email if coordinated.

1.6 WARRANTIES

- A. All manufacturer and supplier standard equipment, item or accessory warranties shall be the Contractor's responsibility under Project warranty period.
- B. System, equipment, item, or accessory warranties shall commence upon the date of Substantial Completion.
- C. All warranties longer than the Project warranty period shall be assigned to the Owner.

- D. Specified or indicated warranties in the project may remain the responsibility of the Contractor after expiration of Project warranty period.
- E. For equipment put into use during construction the warranties will start at Substantial Completion. Warranty start date may be provided during construction by permission of Owner, submit warranty data within 10 days after first operation.
- F. For items of Work delayed materially beyond Date of Substantial Completion, provide updated warranty data within ten days after Owner acceptance, listing date of acceptance as start of warranty period.

1.7 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, and maintenance materials in quantities specified in each Section, in addition to that used for construction of Work. Coordinate with Owner, deliver to Project site, and obtain receipt prior to final payment.
- B. Provide a table listing extra stock materials required by the various specification sections. At a minimum include specification section number, section name, paragraph, material, date received, received by, and placed stored.

1.8 SYSTEMS DEMONSTRATION AND INSTRUCTIONS TO OWNER

- A. Prior to substantial completion, demonstrate operation of each system to Contracting Officer.
- B. Prepare a comprehensive training schedule and submit to the Contracting Officer for review and approval a minimum of 14 days prior to planned date of first training session.
- C. Prior to substantial completion instruct designated Owner personnel in proper operation, adjustment, and maintenance of equipment and systems, utilizing an accepted Operations and Maintenance Manual.
- D. Instruct only those Owner personnel specifically designated by the Contracting Officer. Instruction of other Owner personnel will not meet the requirements of this section.
- E. Reference individual Specification Sections for additional Owner instruction requirements.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 01 73 29 - CUTTING AND PATCHING

- A. Requirements and limitations for cutting and patching of Work.

1.2 SUBMITTALS

- A. Submit written request two weeks 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.

- B. Include in request:

1. Identification of Project and Owner's Project number.
2. Location and description of affected Work.
3. Necessity for cutting or alteration.
4. Description of proposed Work and products to be used.
5. Alternatives to cutting and patching.
6. Effect on Work of Owner or separate Contractor.
7. Written permission of affected separate Contractor.
8. Date and time that Work will be executed.

PART 2 PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New Materials: As specified in individual Specification Sections.
- B. Match existing products and work for patching and extending Work. Determine quality of existing products by inspection and any necessary testing.
- C. For any change in materials, submit request under provisions of Section 01 33 00 the General Requirements.

PART 3 EXECUTION

3.1 GENERAL

- A. Locate penetrations to avoid structural members.
- B. Execute cutting, fitting, and patching including excavation and fill to complete Work, and to:
 - 1. Fit the several parts together, to integrate with other Work.
 - 2. Uncover Work to install ill-timed Work.
 - 3. Remove and replace non-conforming and defective Work.
 - 4. Remove samples of installed Work for testing.
 - 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

3.2 INSPECTION

- A. Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- B. After uncovering, inspect conditions affecting performance of Work.
- C. Beginning of cutting or patching means acceptance of existing conditions.

3.3 PREPARATION

- A. Provide supports to assure structural integrity of surroundings. Provide devices and employ methods as required to protect other portions of Project from damage.
- B. Provide protection from elements for areas that may be exposed by uncovering Work; maintain excavations free of water.
- C. Provide devices and employ methods as required to protect Contractor and Owner personnel from openings in walls, floors, and ceilings through which personnel may fall or through which objects may fall on to personnel below.

3.4 PERFORMANCE

- A. Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- B. For all new Work, employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- C. Cut rigid materials using masonry saw or core drill. Pneumatic tools and electric hammers are not permitted.
- D. Restore Work with new products in accordance with requirements of Contract Documents.
- E. Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- F. Seal pipe and conduit penetrations at rated floors and walls with firestopping installed in accordance with firestopping manufacturer's UL listed installation requirements for indicated rating.
- G. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The overall scope of work for this project is to upgrade the heating system in City Hall as detailed in other sections. A Hazardous Materials Assessment for the proposed construction area(s) and scope of work has been completed as part of this proposed work. Sample locations, and laboratory results collected as part of this assessment are identified on the project drawings. This Specification and the project drawings represent the entirety of the Hazardous Materials Assessment for this project. Hazardous Materials documents for the recently renovated Child Care Facility are included in this design as supplemental information.

1.2 USE OF INFORMATION

- A. Hazardous materials documents are provided for the Contractor's information and use in the planning and performance of renovation work in areas containing hazardous or potentially hazardous materials as described in the sections listed in Paragraph 1.3.
 - 1. The information provided in this Limited Hazardous Materials Assessment is based on project as-built drawings, onsite inspections, and samples collected in various locations within the identified project areas. Actual conditions encountered may vary from the information presented in this assessment.
 - 2. The data reported is accurate to the best of the Owner's knowledge. The requirements contained in these specifications and in the relevant state and federal regulations pertaining to the performance of work in areas containing hazardous or potentially hazardous materials provide guidance for the Contractor for the performance of work in these areas. The Owner disclaims all responsibility for the Contractor's erroneous conclusions regarding the information presented in these reports; the requirements contained in these specifications; and the requirements of applicable state and federal regulations pertaining to performance of work in these areas.
 - 3. The Contractor shall be responsible for obtaining additional information if the Owner deems it necessary to carry out the work.
- B. The Project is to complete renovation, including selective demolition, as described by other disciplines in these construction documents. Although the hazardous materials documents indicate the location of all known hazardous materials contained in the structure, abatement of hazardous materials is necessary only for those hazardous materials that will be disturbed by the selective demolition and renovation activities.
- C. It is highly recommended that the Contractor visit the site to acquaint themselves with existing conditions.

1.3 RELATED SECTIONS

- A. Section 02 82 33 – Removal and Disposal of Asbestos Containing Materials
- B. Section 02 83 34 – Removal and Disposal of Materials Containing Lead and PCBs

1.4 HAZARDOUS MATERIALS NOTIFICATION

- A. Suspect asbestos containing materials (ACM) identified within the expected work areas have been tested for asbestos. Identified ACM is described on Sheet H100. Sample locations and results are shown on Sheets H101-H103, with specific locations of ACM TSI in the basement and crawlspace depicted on Sheet H104.
- B. Paint has been tested for lead within the project area. Results are below the United States Environmental Protection Agency (EPA)/Department of Housing and Urban Development (HUD) guidance of 1.0 milligram per square centimeter (mg/cm²) and are not considered to be lead-based paint or LBP. Sample locations and results are shown on Sheets H101-H103. Additional results indicating LBP on materials not expected to be impacted by project efforts are detailed in the previous Child Care Facility assessment reports.
- C. Paints have been tested for polychlorinated biphenyl (PCB) concentrations. PCBs were identified in multiple paints at detectable concentrations. PCBs are assumed to be present at all locations of work with paint, except radiators and associated components. Sample locations and results are shown on Sheets H101-H103.
- D. A variety of other items that may be hazardous to handle or dispose of are present in the building. These potentially hazardous items may include, but are not limited to, lighting system components (lamps, ballasts, etc), emergency exit light fixtures, exit signs, fire extinguishers, and hydraulic door closers. The Contractor is responsible for the proper handling and disposal of these items if impacted by work specified elsewhere.
- E. Notification of Potential Hazards: Asbestos, lead, PCBs, and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated contaminants, including asbestos and lead, may also be present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems associated with this project. All trades shall coordinate with other trades and conduct their work in a manner that prevents worker exposure and site contamination.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 02 41 19 - SELECTIVE DEMOLITION

- A. This section covers selective demolition for renovation projects, including abatement of hazardous materials.

1.2 SUBMITTALS

- A. Submit permits and notification as required by Alaska Department of Environmental Conservation and other regulatory authorities.
- B. Submit dump receipts, bills of lading, handling and tracking records, and other information demonstrating that all debris and abandoned items resulting from demolition operations have been legally and properly removed from the site.

PART 2 PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New Materials: As specified in individual Specification Sections.
- B. Match existing products and work for patching and extending Work. Determine quality of existing products by inspection and any necessary testing.

PART 3 EXECUTION

3.1 GENERAL

- A. Remove existing work, materials and items as indicated on the Drawings, as required by job site conditions, as scheduled, and as specified herein, to accomplish Work and alteration in the existing building.
- B. Remove work carefully and only to the extent required for the final Work. Minimize damage to adjacent materials.
- C. When portions of existing conditions are shown, it is not meant to indicate that all existing conditions are shown.
- D. Patch existing surfaces which are made defective in appearance or function by the execution of Work.

- E. Cut rigid materials using masonry saw or core drill. Pneumatic tools and electric hammers are not permitted.
- F. Conduct all operations with a minimum of noise.

3.2 PREPARATION FOR DEMOLITION

- A. Plan all work in advance, informing Contracting Officer of procedure and schedule.
- B. Verify existing conditions affecting Work including existing sizes and materials indicated prior to beginning Work or ordering materials that are affected by existing conditions. Notify Contracting Officer of conflicts in writing.
- C. Take reasonable and adequate precautions to protect the Owner's property from damage during demolition Work, moving of debris, and damage by the elements. Restore any damage to Owner property due to the aforesaid work or replace in a manner satisfactory to the Contracting Officer.
- D. Provide and maintain suitable barricades, shelters, lights, and danger signals during the progress of the Work. Provide barricades meeting the requirements of the applicable building codes. Assume the responsibility of barriers to completion of Contract and remove at completion of Contract.
- E. Erect dust-proof partitions where demolition work is in progress and as directed. Such partitions shall remain in place until their removal is directed.
- F. Where openings are to be cut in existing structures, cut such openings with care. Where materials, equipment, frames, etc., are to be removed, remove such items with care to minimize damage to adjacent materials.
- G. Locate penetrations to avoid structural members.

3.3 SELECTIVE DEMOLITION

- A. Cut, move, or remove items as necessary for access to alterations and renovations Work; replace and restore at completion.
- B. Cut pockets, openings, chases, depressions, etc., to install or allow for installation of materials or equipment.
- C. Remove unsuitable material, such as rotted wood, rusted metals, and deteriorated masonry and concrete; replace materials as specified for finished Work.

- D. Remove surface finishes and prepare surfaces to provide for proper installation of new Work and new finishes.
- E. Close openings in exterior surfaces to protect existing work and salvage items from weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.

3.4 DISPOSAL OF DEBRIS

- A. Promptly remove from the site, including concealed spaces, debris resulting from construction and demolition operations and abandoned items. No accumulation of debris will be permitted.
- B. Legally and safely dispose of debris resulting from construction and demolition operations at a landfill of the Contractor's choosing off site.
- C. Do not burn debris resulting from construction and demolition operations on site.

3.5 INSPECTION

- A. Verify that demolition is complete, and areas are ready for installation of new Work.
- B. Beginning of restoration Work means acceptance of existing conditions.

3.6 ALTERATION AND RENOVATION

- A. Coordinate Work of alterations and renovations of existing spaces and materials to expedite completion and to accommodate Owner occupancy.
- B. Patch Work in a manner to minimize damage and restore products and finishes to original condition.
- C. Install products as specified in individual Specification Sections.
- D. Refinish visible existing surfaces to remain in renovated rooms and spaces with a neat transition to adjacent new finishes.
- E. In addition to specified replacement of equipment, restore existing mechanical and electrical systems to full operational condition.
- F. Where removal of partitions results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
- G. Trim existing doors as necessary to clear new floor finishes; refinish trimmed areas.
- H. Fit Work at penetrations of surfaces as specified in Cutting and Patching Specification.

3.7 TRANSITIONS

- A. Where new Work abuts or aligns with existing, make a smooth and even transition. Patched Work shall match existing adjacent work in texture and appearance.
- B. Where a change of plane of 1/4-inch or more occurs, submit recommendation for providing a smooth transition for Contracting Officer review.
- C. 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 to Contracting Officer.

3.8 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces which are disturbed, damaged, or otherwise made defective in appearance or function by the execution of Work under this Contract. Restore to original condition.
- B. Repair substrate prior to patching finish.

3.9 FINISHES

- A. Finish surfaces as specified in individual Sections.
- B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.10 HAZARDOUS MATERIALS

- A. There are known hazardous materials present at the Project work area. See Hazard Material Remediation Specification for work related to hazardous materials.
 - 1. See contract drawings and hazardous materials report for detailed locations.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. The work requires the disturbance, demolition, removal, and disposal of asbestos-containing materials (ACM) as shown in the plan sheets and as specified herein. Bulk samples have been taken of suspect materials at this property and the results are documented in the plan sheets. The Contractor's renovation/demolition and abatement work plan(s) must indicate how these materials will be handled to maintain compliance with applicable regulations throughout the project.
- B. ACM identified, and which may impact this project, are listed below:
 - 1. Floor tile and associated mastics (including underneath non-ACM flooring)
 - 2. Pipe insulation (TSI)
 - 3. Ducting sealants
 - 4. Gray spray-on fireproofing (10% vermiculite – assumed $\geq 1\%$ asbestos)
- C. Estimated quantities of ACM TSI are described on H100 of the Hazardous Material Drawings and are based on a comprehensive survey of the building and take-offs from scale drawings. It is the Contractor's responsibility to remove and dispose of all ACM affected by the project from the site in accordance with applicable regulations. The Contractor shall immediately notify the Owner if other ACM or additional quantities are discovered. Quantities of materials removed shall be documented on a daily basis and shall include all materials removed and locations, in the units used in the contract documents.
- D. Notification of Potential Hazards: Asbestos, lead, polychlorinated biphenyls (PCBs), and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos, lead, and PCBs may also be 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. This notification is provided in accordance with Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA) requirements.
- E. Asbestos-containing materials may have come loose and fallen onto or into, floors, ceilings, walls, chases, wall cavities or mechanical, electrical and structural system components. The Contractor shall immediately notify the Owner if and when they encounter worn, damaged, or deteriorated ACM as evidenced by dust or debris adjacent to ACM materials.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02 26 00 – Hazardous Materials Assessment
- B. Section 02 83 34 – Removal and Disposal of Materials Containing Lead and PCBs

1.3 DEFINITIONS AND ABBREVIATIONS

- A. Definitions and abbreviations are provided in the applicable publications listed in Paragraph 1.4 of this section.

1.4 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced.
 - 1. Title 29 Codes of Federal Regulations (CFR), Department of Labor (USDOL)
 - a. Part 1910 General Occupational Safety and Health Standards
 - b. Part 1926 Safety and Health Regulations for Construction
 - 2. Title 40 CFR, Environmental Protection Agency (EPA)
 - a. Part 61 National Emission Standards for Hazardous Air Pollutants
 - b. Part 763 EPA Asbestos Containing Materials in Schools
 - 4. Title 49 CFR, Department of Transportation (DOT)
 - a. Part 171 General Information, Regulations and Definitions
 - b. Part 172 Hazardous Materials Communication and Regulations
 - c. Part 173 General Requirements for Shipments and Packaging
 - d. Part 177 Carriage by Public Highway
 - e. Part 178 Specifications for Packaging
 - f. Part 382 Requirements for Drug Testing
 - g. Part 383 Commercial Driver’s License Standards

5. State of Alaska Administrative Codes (AAC)
 - a. 8 AAC 61 Occupational Safety and Health Standards
 - b. 18 AAC 60 Solid Waste Management
6. State of Alaska Statutes (AS)
 - a. AS 18.31 Health and Safety - Asbestos
 - b. AS 45.50.477 Titles Relating to Industrial Hygiene
7. Public Law 101-637
 - a. Asbestos School Hazard Abatement Reauthorization Act
8. Federal Standards
 - a. 313E Safety Data Sheets
9. American National Standard Institute (ANSI)
 - a. Z9.2 Local Exhaust Systems
 - b. Z87.1 Eye and Face Protection
 - c. Z88.2 Practices for Respiratory Protection
10. American Society for Testing and Materials (ASTM)
 - a. D-4397 Polyethylene Sheeting
11. National Fire Protection Association (NFPA)
 - a. NFPA 701 Fire Tests for Flame Resistant Textiles and Films
12. National Institute of Occupational Safety and Health (NIOSH)
 - a. Manual of Analytical Methods, Current Edition
13. Underwriters Laboratories (UL)
 - a. UL 586 High-Efficiency, Particulate, Air (HEPA) Filter Units

1.5 QUALITY ASSURANCE

A. On-site Observation

1. The safety and protection of the Contractor's employees, sub-contractor's employees, Owner's employees, the facility, and the public is the sole responsibility of the Contractor.
2. The Owner or representatives of State or Federal agencies may make unannounced visits to the site during the work. The Contractor shall make available two complete sets of clean, protective clothing for such visitor use. If the work requires the use of PAPR or Supplied Air Respirators, the Contractor shall provide respirators to the visitor with fresh batteries or supplied air system. It is the visitor's responsibility to ensure medical qualification, training, and current "fit test" prior to using any respirator provided by the Contractor.
3. If the Owner or agency visitor determines that practices are in violation of applicable regulations; they will immediately notify the Contractor that operations must cease until corrective action is taken. Such notification will be followed by formal confirmation.
4. The Contractor shall stop work after receiving such notification. The work may not be restarted until the Contractor receives written authorization from the Owner.
5. All costs resulting from such a stop work order shall be borne by the Contractor and shall not be a basis for an increase in the contract amount or an extension of time.

B. Air Monitoring: Air monitoring during the work shall be performed as follows:

1. The Contractor shall hire an Independent Testing Laboratory to collect and evaluate all air samples that are the responsibility of the Contractor. The Contractor shall direct the Testing Laboratory, in writing, to release air monitoring data, and all other pertinent data and records, to the Owner. A copy of this written direction shall be submitted to the Owner along with the information required by Paragraph 1.13 of this Specification.
2. The Contractor shall be responsible for monitoring its employees for potential exposure to airborne asbestos fibers as required by this specification and all applicable regulations.
3. The Contractor shall be responsible for work area monitoring and environmental monitoring outside the work area as required by this specification.
4. The Owner may perform air monitoring inside the building, inside the work areas, and on the Contractor's employees while asbestos work is underway and at any time during the work.

5. Final inspection and clearance air monitoring shall be conducted by the Contractor's Independent Testing Laboratory. The Independent Testing Laboratory may not be hired by the Abatement Subcontractor to perform final visual inspections and clearance air monitoring.
 6. The Contractor shall have the Independent Testing Laboratory archive all air samples until the successful completion of the project.
- C. Additional Sampling of Suspect Materials:
1. The Contractor and all Subcontractors shall be vigilant during renovation/demolition and construction in the event additional suspect asbestos or hazardous materials are encountered. If suspect asbestos or hazardous materials not previously identified are encountered, the Contractor shall stop work that may be affected by this material and immediately notify the Owner. The Owner will provide recommendations and additional testing if necessary.
 2. The Contractor and all Subcontractors shall notify the Owner prior to any bulk sampling of suspect asbestos-containing material or other hazardous materials to allow the Owner to be present during such sampling. All results of bulk sampling conducted by the Contractor or Subcontractors shall be submitted to the Owner.
- 1.6 PROTECTION OF EXISTING WORK TO REMAIN
- A. Perform asbestos removal in the project work areas without contamination of adjacent work areas or facilities.
- 1.7 MEDICAL REQUIREMENTS
- A. Institute and maintain a medical surveillance program for employees in accordance with 29 CFR 1926.1101 and 29 CFR 1910.134.
 - B. Institute and maintain a random drug testing program, as required by 49 CFR 382, for all drivers of vehicles transporting asbestos or hazardous materials.
- 1.8 TRAINING
- A. Employ only workers who are trained and certified as required by 29 CFR 1910, 29 CFR 1926, 40 CFR 763, and 49 CFR 383 to remove, encapsulate, barricade, transport, or dispose of asbestos.
- 1.9 PERMITS AND NOTIFICATIONS
- A. Secure necessary permits for asbestos removal, hauling, and disposal and provide timely notification as required by federal, state, and local authorities.

1.10 SAFETY AND ENVIRONMENTAL COMPLIANCE

- A. Comply with laws, ordinances, rules, and regulations of federal, state, and local authorities regarding handling, storing, transporting, and disposing of hazardous materials and all other construction activities.

1.11 RESPIRATOR PROGRAM

- A. Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134.

1.12 HAZARD AND COMMUNICATION PROGRAM

- A. Implement a hazard communication program in accordance with 29 CFR 1910.1200.

1.13 SUBMITTALS

- A. The Contractor shall submit the following documentation to the Owner for review, approval or rejection. Work shall not begin until submittals are approved.

1. Shop Drawings
2. Work plan
3. Liability insurance policy and performance bond
4. Schedule
5. Testing laboratory and laboratory personnel
6. Disposal site designations and disposal authorizations
7. Waste transporter designation
8. Notifications and certifications
9. "Competent Person" designation and experience
10. Request for substitutions

- B. Shop drawings shall show:

1. Boundaries of each regulated work area
2. Location and construction of decontamination areas
3. Location of temporary site storage facilities

4. Location of air monitoring stations, both in and outside of the work area
 5. Emergency egress route(s)
 6. Location of negative pressure exhaust systems, if required
- C. The work plan shall include procedures for:
1. Work area setup and protection
 2. Worker protection and decontamination
 3. Initial exposure assessment procedures
 4. Asbestos removal procedures
 5. Waste load-out, transport, and disposal procedures
 6. Air monitoring procedures
 - a. Air monitoring procedures shall include the number of daily samples and the target volumes of each type of sample
 - b. Clearance air monitoring procedures and protocols for each work area
 7. Determination by the Certified Project Designer of the estimated quantities of ACM and PACM to be removed, and determination of clearance requirements for each different type or phase of work
 8. Emergency procedures
 9. The Work Plan shall be prepared, signed and dated by an Environmental Protection Agency (EPA) Certified Project Designer
- D. Insurance Policy and Bond: Submit copies of the Contractor's or Subcontractor's insurance policy and performance bond. Submittal requirement is only to ensure that the insurance certificate(s) show specific coverage for the potentially hazardous materials being handled by this project. The insurance and bond amounts and certificate holder requirements are addressed in other portions of the contract documents and are not covered as part of this submittal requirement.
- E. Schedule: Submit construction schedule by work area.

- F. Independent Testing Laboratory(ies) and Laboratory Personnel: Submit the name, location, and phone number of each proposed Independent Testing Laboratory, and the names and certifications of the industrial hygiene technicians. Include the laboratory's accreditation. Not all laboratories will require all accreditations.
1. The Independent Testing Laboratory shall be acceptable to the Owner.
 - a. The Independent Testing Laboratory shall be proficient in the NIOSH Proficiency in Analytical Testing (PAT) program and shall be accredited by the National Institute of Science and Technology (NIST) under their National Voluntary Laboratory Accreditation Program (NVLAP) for bulk asbestos analysis and airborne asbestos fibers as appropriate. NVLAP accreditation for bulk asbestos analysis may be waived if the microscopists are listed in the American Industrial Hygiene Association (AIHA) Asbestos Analyst Registry (AAR).
 - b. Provide a current list of their microscopists who have participated in the latest PAT and NVLAP programs and provide the names of microscopists and evidence that they have completed the NIOSH 582 course or equivalent. Provide latest AAR report of performance for microscopists.
 - c. Provide name(s) and resume(s) of proposed on-site industrial hygiene technician(s) showing academic degrees and Alaska Abatement Certificate(s).
- G. Disposal Site: Submit the name and location of the proposed Alaska Department of Environmental Conservation/ U.S. Environmental Protection Agency (DEC/EPA) permitted disposal site. Submit authorization to dispose of asbestos waste by the proposed disposal site operator.
- H. Waste Transporter: Submit the name and address of the proposed waste transporter.
- I. Representations: Submit a signed statement by the Contractor that records of employees' work assignments, certifications, respirator fit tests, and medical records are accurate, up-to-date, and available for inspection.
- J. Notifications and Certificates:
1. Submit a copy of the written "Notification of Demolition and Renovation" to the Environmental Protection Agency. (If required by NESHAP).
 2. Submit a State of Alaska Department of Labor (ADOL) approved copy of the written ADOL notification of proposed workers.
 3. Submit a copy of Project Designer's current certification.

- K. Competent Person: Submit the name and certifications of the Contractor's proposed Competent Person and a list of their previous projects. Certify by signed statement that the Competent Person has the knowledge and training to supervise the work in compliance with the publications listed in Paragraph 1.4 above.
- L. Substitutions: Submit requests for substitutions of materials, equipment and methods.
- M. Updated Project Information: Submit changes to the submitted project information at least 24 hours prior to the effective time of change for the following:
 - 1. Updated schedules.
 - 2. Change in Competent Person.
 - 3. ADOL approval for additional workers.
 - 4. Changes to work plan.
 - 5. Revisions to the EPA notification.

1.14 TEST REPORTS

- A. Contractor shall submit periodic test reports, daily logs, and monitoring results as specified herein. Submit 2 copies of the following information within 24 hours after the end of a shift:
 - 1. Initial Exposure Assessment(s): Submit the results of the Contractor's initial exposure assessment(s).
 - 2. Daily Air Monitoring: Submit daily, all results of Contractor's air monitoring. Submittal shall consist of negative air pressure recordings, daily monitoring report, field data sheets, and the analytical laboratory's results, and sketch of sample locations.
 - 3. Bulk Samples: Submit all results of any sampling of bulk materials to Owner within 24 hours of receipt of results. Bulk sample submittal shall consist of daily monitoring report, field data sheets, and the analytical laboratory's results, and sketch of sample locations.
 - 4. Project Daily Logs: Submit the previous day's Daily Logs. Logs shall include regulated area sign-in sheets and list of asbestos-containing materials removed including quantities and locations of those materials, in the units used on the drawings. Claims for additional quantities will not be addressed unless daily quantities are submitted.

5. Clearance Air Monitoring: Submit draft results of Contractor's clearance air monitoring for each work area for Owner review and approval prior to releasing the work area to unprotected workers. Fax or electronic submittals are acceptable. Submittal shall include the following:
 - a. A signed and dated copy of the final visual inspection report (completed prior to clearance air monitoring) certifying that all dust and debris have been removed from the work area and that all ACM to be removed as required by the contract, were removed. Visual inspection reports are required for all removal, even if clearance air monitoring is not required.
 - b. Documentation that clearance air sample collection complied with 40 CFR 763, contract specifications and the approved work plan.
 - c. Drawings of the work area with sampling locations clearly marked. Work area drawings shall be clearly identified as to their location within the facility.
 - d. Field data sheets for sampling including sample locations, calibration device serial number, initial and final pump calibration readings, pump time on and off, initial and final sampling flow rate, pump type and serial number, and sample cassette identification.
 - e. Laboratory results, signed and dated by the analyst.
 - f. Data sheets and visual inspection sheets shall be signed and dated by the Industrial Hygiene Technician performing the work.

1.15 PROJECT COMPLIANCE DOCUMENTS

- A. Prepare and submit the following records of compliance with hazardous materials regulations following each work area clearance. Submittals may contain segregated submittals for more than 1 work area. Submittal shall be received by Owner within 4 weeks following work area clearance. Compliance documents shall be signed and dated and shall include as a minimum:
 1. Waste transport records (40 CFR 61, Figure 4).
 2. Disposal site receipts.
 3. Contractor's "Start" and "Finish" dates for the work area(s).
 4. Daily logs, including regulated area sign in sheets, materials summary, etc. (if not previously submitted).
 5. Final work area inspection report(s) and inspector certifications (if not previously submitted).

6. Final, signed, clean copies of all bulk and air sampling field data sheets, location drawings, and air monitoring log, including all clearance data.
7. Final, signed, clear, legible copies of all analytical laboratory bulk and air monitoring test results, including all clearance data, and current laboratory certifications (if changed from previously submitted).
8. Copies of Asbestos Worker Training certificates for workers performing work on this project and all approved Alaska DOL notifications for those workers, and any revisions to the EPA notification(s).

1.16 SANITARY FACILITIES

- A. Provide adequate toilet and hygiene facilities.

1.17 MATERIAL STORAGE

- A. Store all materials subject to damage off the ground and secure from damage, weather, or vandalism.

1.18 ON-SITE DOCUMENTATION

- A. The Contractor shall maintain on the job site, at a location approved by the Owner, copies of the following data for safety procedures, equipment, and supplies used for the work.
 1. Equipment: Show the model, style, capacity and the operation and maintenance procedures for the following, as applicable:
 - a. HEPA Filtration units.
 - b. HEPA Vacuum cleaners.
 - c. Pressure differential recording equipment.
 - d. Heat stress monitoring equipment.
 2. Safety Data Sheets (SDS): Maintain SDSs for each encapsulant, surfactant, solvent, detergent, and other material proposed to be used.
 3. Respiratory Protection Plan: The Contractor's and/or Subcontractor's written respirator program.

PART 2 - PRODUCTS

2.1 PERSONAL PROTECTIVE EQUIPMENT

- A. Provide personal protective clothing as approved and selected by the IH.
 - 1. Respirators: Provide personally issued and marked respirators approved by the NIOSH. Provide sufficient replacements for respirators with disposable canisters. Use respirators equipped with dual cartridges whenever both asbestos hazards and other respiratory hazards exist in the work area.
 - a. Provide filter cartridges approved for each airborne contaminant which may be present. NIOSH approved filter cartridges shall be used. At no time shall the permissible exposure limit (PEL) for the contaminant exceed the PEL listed in 8 AAC 61.1100.
 - b. Whole Body Protection: Provide approved disposable fire retardant, full body coveralls and hoods fabricated from nonwoven fabric, gloves, eye protection, and hard-hats, and other protective clothing as required to meet applicable safety regulations to personnel potentially exposed to asbestos above the PELs. Wear this protection properly. Full facepiece respirators shall meet the requirements of ANSI Z87.1.
 - c. Provide protective personal equipment and clothing at no cost to the workers.

2.2 DECONTAMINATION UNIT

- A. Provide a temporary three-stage decontamination unit, attached in a leak-tight manner to each negative pressure work area. Decontamination units shall consist of a clean room equipped with separate lockers for each worker, a shower room, and an equipment locker room equipped with separate lockers for each worker.
- B. Shower specifications: Locate flow and temperature controls within the shower where adjustable by the user. Hot water service may be secured from the building hot water system if available, but only with back-flow protection installed by the Contractor at the point of connection, and with prior notification and approval by the Owner. Should sufficient hot water be unavailable, the Contractor shall provide a minimum 40-gallon electric hot water heater with a minimum recovery rate of 20 gallons per minute. Water from the shower room shall not be allowed to wet the floor in the clean room.

2.3 WASTEWATER FILTERS

- A. Provide Water Filtration Units with filters of adequate capacity to treat decontamination water and shower wastewater flows. Water filtration unit effluent shall contain less than 7,000,000 asbestos fibers per liter prior to discharge to sanitary sewer or storm drains.

2.4 DANGER SIGNS AND TAPE

- A. Post danger signs and tape signs to demarcate areas where asbestos waste is temporarily stored, and, in areas not accessible to the public, where asbestos containing materials are left in place. Signs and labels shall be in accordance with applicable regulations and codes. The signs posted at work area entrances, exits, decontamination areas, emergency egress, and waste disposal areas shall comply with 29 CFR 1926.1101 and the International Fire Code.

2.5 WARNING LABELS

- A. Affix warning labels to all components or containers containing asbestos wastes. Conform labeling to 29 CFR 1926.1101 and 49 CFR 172.

2.6 HEPA FILTRATION UNITS

- A. If required, shall conform to ANSI Z9.2, and HEPA filters shall be UL-586 labeled.

2.7 PRESSURE DIFFERENTIAL MONITORING EQUIPMENT

- A. Provide continuous monitoring of the pressure differential with an automatic recording instrument for each negative pressure enclosure. Locate the instrument in a clean area where personnel have access to it without respiratory protection. The instrument shall be fitted with an alarm should the negative pressure drop below -0.02 inches of water column relative to the air outside containment.

2.8 CHEMICALS

- A. Adhesives: Adhesives shall be capable of sealing joints of adjacent sheets of polyethylene to finished or unfinished surfaces and of adhering under both dry and wet conditions.
- B. Mastic Removal Solvents: Mastic removal solvents shall not contain halogenated compounds or compounds with flashpoints less than 60° C (140° F). Solvents shall be compatible with replacement materials.
- C. Sealants and Encapsulants: Penetrating and bridging encapsulants may be necessary for asbestos applications. Tint "Lock-Down" encapsulants used in non-finished areas for identification in a color that will not obscure residual asbestos. Encapsulants shall be compatible with replacement materials.

- D. Surfactant: Use a surfactant specifically designed to effectively wet asbestos. Mix and apply the surfactant as recommended by the manufacturer.

2.9 SAFETY DATA SHEETS (SDSS)

- A. Provide SDSs for all chemical materials brought onto the worksite.

2.10 MATERIALS

- A. Disposal Containers: Use disposal containers to receive, retain, and dispose of asbestos containing or contaminated materials. Containers must be leak tight; non-leak tight containers are not acceptable. Label leak tight containers in accordance with the applicable regulations. Plastic bags shall be a minimum 6-mil polyethylene, pre-printed with approved warning labels. Plastic wrap shall be 6-mil polyethylene sheets, securely wrapped and taped. Disposal containers shall be labeled with "ASBESTOS NA 2212," Contractor's name and location, and a Class 9 DOT label.
- B. Glove Bags: The glove bags shall be a minimum of 6-mil polyethylene or polyvinylchloride plastic and specially designed for removal of asbestos-containing materials, with two inward projecting long sleeves and rubber gloves, one inward projecting water wand sleeve, an internal tool pouch, and an attached, labeled receptacle for asbestos waste.
- C. Plastic Sheet: A minimum 6-mil thick flame-resistant polyethylene (in accordance with NFPA 701) shall be used unless otherwise specified.
- D. Tape: Tape shall be capable of sealing joints of adjacent sheets of polyethylene, for attachment of polyethylene sheets to finished or unfinished surfaces and of adhering under both dry and wet conditions.

2.11 OTHER MATERIALS

- A. The Contractor shall provide standard commercial quality of all other materials as required to prepare and complete the work.

2.12 TOOLS AND EQUIPMENT

- A. The Contractor shall provide tools and equipment as required to prepare and complete the work. Tools and equipment shall meet all applicable safety regulations.
- B. Transportation equipment shall be suitable for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property. All trucks or vans used to transport asbestos shall be enclosed and all containers sealed leak tight.
- C. Truck drivers shall have a commercial driver's license with hazardous material endorsement.

PART 3 - EXECUTION

3.1 WORK AREAS

- A. Regulated Work Areas: Establish regulated work areas in compliance with 29 CFR 1926.1101.
- B. Decontamination Area: Install decontamination areas in compliance with 29 CFR 1926.1101. Decontamination area shall meet fire-exiting requirements of the International Fire Code. Showers shall be provided with hot water and wastewater filtration units.
- C. Negative Pressure Enclosure System: Construct Negative Pressure Enclosure Systems as required by 29 CFR 1926.1101, these specifications, and approved work plan. Signage shall conform to the International Fire Code and 29 CFR 1926.1101. Exhausts from HEPA Filtration Units shall terminate outside of the building.
- D. Notify applicable Fire Marshal as required by the International Fire Code.

3.2 PERSONNEL PROTECTION PROCEDURES

- A. Contractor's Competent Person shall strictly enforce personal protection procedures as required by the approved work plan and all applicable regulations.
- B. Post the decontamination, safety, and work procedures to be followed by workers.
- C. Provide continuous on-site supervision by the approved Competent Person.
- D. Maintain a daily log of all workers and visitors entering regulated work areas. Log shall contain the name of each individual, his or her organization, accurate time of entering and leaving, and purpose of visit.

3.3 ASBESTOS REMOVAL PROCEDURES

- A. Remove asbestos in accordance with the Contractor's Approved Work Plan, applicable regulations and this specification. The Owner shall be notified 24 hours in advance of any asbestos disturbance taking place outside of a Negative Pressure Enclosure System.

3.4 AIR MONITORING

- A. Perform personal, work area, and environmental monitoring for airborne asbestos fibers by industrial hygiene technicians who are employees of the Contractor's Independent Testing Laboratory.

- B. Conduct air monitoring in accordance with 29 CFR 1926.1101, current EPA guidance, and as specified herein. Calibrate all sampling pumps on-site with a calibrated transfer standard before and after each sample. Built-in rotameters on pumps are not acceptable for calibration. Additional samples beyond the minimum numbers shown below may be necessary if samples are overloaded or require shorter sampling periods to achieve readable samples, due to size of the work force, or due to more than one 8-hour work shifts.
- C. Conduct daily work area and environmental air monitoring per shift as follows:
 - 1. (3) air samples within the work area.
 - 2. (1) air sample located outside the entrance to the work area.
 - 3. (1) air sample located at the exhaust(s) of the HEPA filtration unit(s) (if more than one unit is used, the sampling may be rotated between units, however, each unit must be sampled at least once every three days).
 - 4. (3) air samples located in adjacent occupied areas.
 - 5. (2) waste load-out samples for the full duration of the operation, one taken inside the wash-down station and one taken on the clean side of the wash-down station, in addition to the daily work area and environmental samples, (no samples are necessary if no load-out operation is performed).
- D. Conduct personal air monitoring in accordance with 29 CFR 1926.1101 and as specified herein.
 - 1. Take personnel samples (excluding excursion samples) at least twice per 8-hour work shift at the rate of (1) sample for every (6) people performing that task in the same work area. Persons performing separate tasks or in separate work areas shall be sampled separately.
 - 2. Collect and analyze excursion samples as required by 29 CFR 1926.1101.
 - 3. Continuously monitor all workers disturbing asbestos outside of a Negative Pressure Enclosure System if that work is conducted indoors.
- E. Daily personnel monitoring may be discontinued only after the Contractor's Independent Testing Laboratory certifies in writing that a Negative Exposure Assessment has been obtained and the Owner has reviewed and approved the negative exposure assessment data.
- F. Submit air monitoring results to the Owner as specified in Paragraphs 1.14 and 1.15.

3.5 DISPOSAL

- A. Dispose of asbestos wastes in an EPA/DEC permitted asbestos landfill.
- B. Comply with current waste disposal, handling, labeling, storage, and transportation requirements of the waste disposal facility, U.S. Department of Transportation, and EPA regulations.

3.6 CLEANING OF WORK AREA

- A. Remove all asbestos material and debris upon completion of asbestos repair or removal within a work area. Wet clean or HEPA vacuum all surfaces within the work area.
- B. Notify the Owner and the Independent Testing Laboratory that asbestos work has been completed, and the work area is ready for visual inspection. Visual inspections are required even if clearance air monitoring is not required. Include in the visual inspection report a statement that all asbestos in the work area has been removed, repaired and/or encapsulated as required by the contract, and that all debris has been removed.
- C. A lockdown encapsulant shall be applied to all surfaces within the abatement areas prior to performing clearance air monitoring.

3.7 CLEARANCE AIR MONITORING

- A. The Contractor and its Independent Testing Laboratory shall conduct and document a visual inspection to verify that all asbestos in the work area has been removed, repaired and/or encapsulated as required by the contract, and that all debris has been removed.
- B. Final clearance air monitoring tests shall not be performed until all areas and materials within the work area are fully clean and dry.
- C. Final clearance air monitoring shall be conducted by the Contractor's Independent Testing Laboratory in accordance with all applicable regulations and the Contractor's approved work plan after passing the visual inspection. The clearance criteria shall include a minimum of five clearance samples using "aggressive methods" collected and analyzed in accordance with 40 CFR 763.
- D. If the final clearance air monitoring results show that the work area has failed to meet the clearance criteria, the Independent Testing Laboratory shall notify the Owner and the Contractor. The Contractor shall re-clean the work area and request the Independent Testing Laboratory to conduct a follow-up inspection to be followed by another set of clearance air monitoring samples. All work specified in this paragraph shall be done at no additional expense to the Owner.

- E. If the clearance air monitoring results meet the clearance criteria of 40 CFR 763 and the specifications for the work and the Owner has reviewed and accepted the clearance results as required by Paragraph 1.14, then the HEPA filtration units may be deactivated (if applicable) and all seals, barriers, barricades, and decontamination areas shall be dismantled and removed and the work area released to unprotected workers.
- F. Submit the final work area inspection report, clearance air monitoring field data sheets and the laboratory air monitoring report to the Owner as specified in Paragraph 1.15.

3.8 SUBSTANTIAL COMPLETION

- A. After the work area barriers and temporary construction and equipment have been removed, the Contractor shall inspect the work area to verify that no asbestos debris, contaminated water, or other residue remains. Any remaining residue shall be cleaned up using HEPA vacuum cleaners and wet wiping methods.
- B. The Contractor shall certify that the work area has been cleaned of all asbestos in compliance with the contract.
- C. Costs of restoration of damage to adjacent areas or properties shall be borne by the Contractor.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. The work may require disturbance (including cleanup of existing loose paint), demolition, or removal and disposal of lead and polychlorinated biphenyl (PCB) painted materials as shown in the plan sheets and as specified herein.
- B. PCB and lead-containing items to be disturbed include, but are not limited to:
 - 1. All painted surfaces, except radiators
- C. Notification of Potential Hazards: Asbestos, lead, PCBs and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos, lead, and PCBs 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. This notification is provided in accordance with EPA and OSHA requirements.
- D. The work includes all air monitoring, dust sampling, waste testing and disposal as specified herein. Materials listed are not necessarily hazardous waste or hazardous to handle.
- E. Expected waste streams with lead containing paints or lead containing materials identified for renovation/demolition and disposal require evaluation by the Toxicity Characteristics Leaching Procedure (TCLP). Metal waste shall be recycled where practical.
- F. Expected waste streams with PCB containing paints or PCB containing materials identified for renovation/demolition, and disposal require transfer/disposal out of state. Metal waste shall be recycled where practical.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02 26 00 Hazardous Materials Assessment
- B. Section 02 82 33 Removal and Disposal of Asbestos Containing Materials

1.3 DEFINITIONS AND ABBREVIATIONS

- A. Definitions and abbreviations are provided in the applicable publications listed in Paragraph 1.4 of this section.

1.4 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced.
 - 1. Title 29 CFR, Department of Labor (USDOL)
 - a. Part 1910 General Occupational Safety and Health Standards
 - b. Part 1926 Safety and Health Regulations for Construction
 - 2. Title 40 CFR, EPA
 - a. Part 260 Hazardous Waste Management System: General
 - b. Part 261 Identification and Listing of Hazardous Wastes
 - c. Part 262 Standards Applicable to Generators of Hazardous Waste
 - d. Part 263 Standards Applicable to Transporters of Hazardous Waste
 - e. Part 270 Hazardous Waste Permit Program
 - f. Part 273 Standards for Universal Waste Management
 - g. Part 311 Worker Protection
 - h. Part 761 Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.
 - 3. Title 49 CFR, DOT
 - a. Part 171 General Information, Regulations and Definitions
 - b. Part 172 Hazardous Materials Communication and Regulations
 - c. Part 173 General Requirements for Shipments and Packaging
 - d. Part 176 Carriage by Vessel
 - e. Part 177 Carriage by Public Highway
 - f. Part 178 Specifications for Packaging

- g. Part 382 Requirements for Drug Testing
- h. Part 383 Commercial Driver's License Standards
- 4. Alaska Administrative Code
 - a. 8 AAC 61 Occupational Safety and Health Standards
 - b. 18 AAC 60 Solid Waste Management
 - c. 18 AAC 62 Hazardous Waste Management
 - d. 18 AAC 70 Water Quality Standards
 - e. 18 AAC 75 Oil and Hazardous Substances Pollution Control
- 5. Alaska Statutes (AS)
 - a. AS 45.50.477 Titles Relating to Industrial Hygiene
- 6. Federal Standards
 - a. 313E Safety Data Sheets
- 7. American National Standards Institute (ANSI)
 - a. Z9.2 Local Exhaust Systems
 - b. Z87.1 Eye and Face Protection
 - c. Z88.2 Practices for Respiratory Protection
- 8. ASTM
 - a. D 4397 Polyethylene Sheeting
 - b. E 1728 Standard Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Lead Determination
 - c. E 1792 Specification for Wipe Sampling Materials for Lead in Surface Dust
- 9. NFPA 701 Fire Tests for Flame Resistant Textiles and Films
- 10. NIOSH Manual of Analytical Methods, Current Edition
- 11. UL 586 HEPA Filter Units

1.5 QUALITY ASSURANCE

A. On-site Observation:

1. The safety and protection of the Contractor's employees, Subcontractor's employees, Owner's employees, the facility, and the public is the sole responsibility of the Contractor.
2. The Owner or representatives of State or Federal agencies may make unannounced visits to the site during the work. The Contractor shall make available (2) complete sets of clean, protective clothing for such visitor use. If the work requires the use of PAPR or Supplied Air Respirators, the Contractor shall provide respirators to the visitor to ensure compatibility with fresh batteries or supplied air system. It is the visitor's responsibility to ensure medical qualification, training, and current "fit test" prior to using any respirator provided by the Contractor.
3. If the Owner or agency visitor determines that practices are in violation of applicable regulations; they will immediately notify the Contractor that operations must cease until corrective action is taken. Such notification will be followed by formal confirmation.
4. The Contractor shall stop work after receiving such notification. The work may not be restarted until the Contractor receives written authorization from the Owner.
5. All costs resulting from such a stop work order shall be borne by the Contractor and shall not be a basis for an increase in the contract amount or an extension of time.

B. Monitoring and Testing: Monitoring and testing during the work shall be performed as follows:

1. The Contractor shall hire an Independent Testing Laboratory to collect and evaluate all air, dust, bulk, and toxicity characteristic leaching procedure (TCLP) samples that are the responsibility of the Contractor. The Contractor shall direct its laboratory, in writing, to release monitoring and testing data, and all other pertinent data and records, to the Owner.
2. The Contractor shall be responsible for monitoring its employees for potential exposure to airborne contaminants as required by this specification and all applicable regulations.
3. The Contractor shall be responsible for work area monitoring and environmental monitoring outside the work area as required by this specification.

4. The Owner may perform monitoring and testing inside the building, inside the work areas, and on the Contractor's employees while work is underway and at any time during the work.
 5. Final inspection and clearance testing shall be conducted by the Contractor.
 6. The Contractor shall have its Independent Testing Laboratory archive all samples until the successful completion of the project.
- C. Additional Sampling of Suspect Materials:
1. The Contractor and all Subcontractors shall be vigilant during renovation and construction in the event additional suspect lead, PCBs, or hazardous materials are encountered. If suspect lead, PCBs, or hazardous materials not previously identified are encountered, the Contractor shall stop work that may be affected by this material and immediately notify the Owner. The Owner will provide recommendations and additional testing if necessary.
 2. The Contractor and all Subcontractors shall notify the Owner prior to any bulk sampling of suspect lead-containing or PCB-containing material or other hazardous materials to allow the Owner to be present during such sampling.
- 1.6 PROTECTION OF EXISTING WORK TO REMAIN
- A. Perform lead and PCB removal in the project work areas without damage or contamination of adjacent work or the facility.
- 1.7 MEDICAL REQUIREMENTS
- A. Institute and maintain a surveillance program in accordance with 29 CFR 1926.62 and 29 CFR 1910.134.
 - B. Institute and maintain a random drug testing program, as required by 49 CFR 382, for all drivers of vehicles transporting hazardous materials.
- 1.8 TRAINING
- A. Employ only workers who are trained and certified as required by 29 CFR 1910, 29 CFR 1926, 40 CFR 311, 40 CFR 745, 40 CFR 761, and 49 CFR 383 to remove, encapsulate, barricade, transport, or dispose of lead-containing and/or PCB-containing materials.

1.9 PERMITS, IDENTIFICATION NUMBERS AND NOTIFICATIONS:

- A. Secure necessary permits for hazardous material removal, storage, transport and disposal and provide timely notification as required by federal, state, and local authorities.

1.10 SAFETY AND ENVIRONMENTAL COMPLIANCE:

- A. Comply with laws, ordinances, rules, and regulations of federal, state, and local authorities regarding handling, storing, transporting, and disposing of hazardous materials and all other construction activities.

1.11 RESPIRATOR PROGRAM:

- A. Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134.

1.12 HAZARD COMMUNICATION PROGRAM:

- A. Implement a hazard communication program in accordance with 29 CFR 1910.1200.

1.13 SUBMITTALS

- A. Submit the following documentation to the Owner for review, approval or rejection. Work shall not begin until submittals are approved.
 - 1. Shop drawings
 - 2. Work plan
 - 3. Liability insurance policy and performance bond
 - 4. Schedule
 - 5. Independent testing laboratory and laboratory personnel
 - 6. Disposal site designations
 - 7. Waste transporter designations
 - 8. Representations
 - 9. "Competent Person" designation and experience
 - 10. Request for substitutions

- B. Shop drawings shall show:
 - 1. Boundaries of each lead and PCB work area
 - 2. Location and construction of decontamination stations, if required
 - 3. Location of temporary site storage facilities
 - 4. Location of air monitoring stations, both in and outside of the work area
 - 5. Emergency egress route(s)
 - 6. Location of negative pressure exhaust systems, if required

- C. The work plan shall include procedures for:
 - 1. Work area set-up and protection
 - 2. Worker protection and decontamination
 - 3. Initial exposure determination(s)
 - 4. Lead and PCB removal procedures
 - 5. Waste testing, transport, and disposal procedures
 - 6. Monitoring and testing procedures (Lead and PCB Sampling and Analysis Plan)
 - 7. Spill clean-up emergency procedures

- D. Insurance Policy and Bond: Submit copies of the Contractor's or Subcontractor's insurance policy and performance bond. Submittal requirement is only to ensure that the insurance certificate(s) show specific coverage for the potentially hazardous materials being handled by this project. The insurance and bond amounts and certificate holder requirements are addressed in other portions of the contract documents and are not covered as part of this submittal requirement.

- E. Schedule: Submit construction schedule by work area.

- F. Independent Testing Laboratories and Laboratory Personnel: Submit the name, location, and phone number of proposed Independent Testing Laboratories, and the names and certifications of the industrial hygiene technicians. Include the laboratory's accreditation. Not all laboratories will require all accreditations.
1. The Independent Testing Laboratories for Lead shall be acceptable to the Owner.
 - a. Submit evidence that the laboratory is currently judged proficient in lead analysis, as determined by the Environmental Lead Proficiency Analytical Testing (ELPAT) Program, of the American Industrial Hygiene Association (AIHA) Environmental Lead Laboratory Accreditation Program (ELLAP) for lead in paint chip, soil, and dust wipe samples.
 - b. Submit evidence that the laboratory is currently certified by OSHA to perform blood lead analysis.
 - c. Submit evidence that the laboratory has demonstrated proficiency as determined by ELPAT or ELLAP performance for NIOSH Method 7082 and/or NIOSH Method 7105 analytical method for the determination of lead in air.
 - d. Submit evidence that the laboratory has demonstrated proficiency in performing analyses according to Method 1311 TCLP, corresponding to the current version of Test Methods for Evaluating Solid Wastes (Chemical Physical Methods), SW846. Evidence may include successful participation in a recognized inter-laboratory quality control program such as a laboratory certified by the California Health and Welfare Agency, Owner of Health Services, or a more informal inter-laboratory quality control program.
 - e. Submit evidence that the laboratory is currently accredited by the AIHA.
 2. The Independent Testing Laboratories for PCBs shall be acceptable to the Owner.
 - a. Submit evidence that the laboratory is currently accredited by a recognized body for the analysis of PCBs in relevant matrices, such as National Environmental Laboratory Accreditation Program (NELAP) accreditation for analysis of PCBs in solid, liquid, and or air samples using EPA-approved methods.
 - b. Submit evidence that the laboratory has demonstrated proficiency in performing analyses according to EPA Method 8082A (PCBs by gas chromatography) or other EPA-approved methods for PCB analysis in solid, liquid, or wipes samples, as applicable by the project scope.

- c. Submit evidence that the laboratory has demonstrated proficiency in performing analyses according to NIOSH Method 5503 (PCBs in Air) or other current NIOSH/EPA-approved methods for the determination of PCBs in air, if air monitoring is required.
 - d. Submit evidence that the laboratory has demonstrated proficiency in performing analyses according to Method 1311 TCLP, corresponding to the current version of Test Methods for Evaluating Solid Wastes (Chemical Physical Methods), SW846, for determining hazardous waste characteristics of PCB-containing materials. Evidence may include successful participation in a recognized inter-laboratory quality control program
 - e. Submit evidence that the laboratory is currently accredited by the AIHA Industrial Hygiene Laboratory Accreditation Program (IHLAP) for relevant PCB analyses, if applicable to the scope of work.
3. Industrial Hygienist and Technicians:
- a. Submit the name, address, telephone number, and résumé of the Contractor's IH who prepared the Lead and PCB SAP and will oversee the on-site monitoring, visual inspections and clearance testing. Submit the names, addresses, and résumés of industrial hygiene technicians who may assist the IH for on-site tasks. Submit documentation that the IH has all the qualifications for the assigned duties as required by the Contractor's liability insurance policy.
 - b. Submit copies of the Contractor's letter to each of the Independent Testing Laboratories, directing each to release all the results for this project to the Owner, as these results become available and as specified herein.
- G. Disposal Site: Submit the name and location of the proposed EPA permitted disposal site.
- H. Waste Transporter: Submit the name and address of the proposed waste transporter.
- I. Representations: Submit statement by the Contractor that records of employees' work assignments, certifications, respirator fit tests, and medical records are accurate, up-to-date, and available for inspection.
- J. Competent Person: Submit the name and certifications of the Contractor's proposed Competent Person and a list of their previous projects. Certify that the Competent Person has the knowledge and training to supervise the work in compliance with the publications listed in Paragraph 1.04 above.
- K. Substitutions: Submit requests for substitutions of materials, equipment and methods.

- L. Updated Project Information: Submit changes to the submitted project information at least 24 hours prior to the effective time of change for the following:
 - 1. Updated schedules for lead and PCB removal
 - 2. Change in Competent Person
 - 3. Changes to work plan

1.14 TEST REPORTS:

- A. Submit the following documentation produced during the work as soon as received:
 - 1. Project Daily Logs: Submit the previous day's Daily Logs. Logs shall include regulated area sign-in sheets and list of lead-containing and PCB-containing materials removed, including quantities and locations of those materials, in the units used on the drawings. Claims for additional quantities will not be addressed unless daily quantities are submitted.
 - 2. Monitoring and testing data sheets and laboratory reports

1.15 PROJECT COMPLIANCE DOCUMENTS:

- A. Submit the following documents to the Owner with application for final payment:
 - 1. Contractor's actual project "Start and Finish" dates
 - 2. Waste testing results per Paragraph 3.05 (A)
 - 3. Waste Shipment Records
 - 4. Clearance sampling laboratory reports.
 - 5. Disposal site receipts
 - 6. Final clearance submittals as outlined in 3.7

1.16 SANITARY FACILITIES:

- A. Provide adequate toilet and hygiene facilities.

1.17 MATERIAL STORAGE:

- A. Store all materials subject to damage off the ground and secure from damage, weather, or vandalism.

1.18 ON-SITE DOCUMENTATION

- A. The Contractor shall maintain on the job site, at a location approved by the Owner, copies of the following data for safety procedures, equipment, and supplies used for the work
 - 1. Equipment: Show the model, style, capacity and the operation and maintenance procedures for the following, as applicable:
 - a. HEPA Filtration units
 - b. HEPA Vacuum cleaners
 - c. Pressure differential recording equipment
 - d. Heat stress monitoring equipment
 - 2. Safety Data Sheets: Maintain SDSs for each encapsulant, surfactant, solvent, detergent, and other material proposed to be used.
 - 3. Respiratory Protection Plan: The Contractor's written respirator program.

PART 2 PRODUCTS

2.1 PERSONAL PROTECTIVE EQUIPMENT

- A. Provide personal protective clothing as approved and selected by the IH.
 - 1. Respirators: Provide personally issued and marked respirators approved by the NIOSH. Provide sufficient replacements for respirators with disposable canisters. Use respirators equipped with dual cartridges whenever both lead hazards and other respiratory hazards exist in the work area.
 - 2. Provide filter cartridges approved for each airborne contaminant which may be present. NIOSH approved filter cartridges shall be used. At no time shall the PEL for the contaminant exceed the PEL listed in 8 AAC 61.1100.
 - 3. Whole Body Protection: Provide approved aprons, gloves, eye protection, and hard-hats, and other protective clothing as required to meet applicable safety regulations to personnel potentially exposed to lead dust or fumes above the PEL. Wear this protection properly. Full facepiece respirators shall meet the requirements of ANSI Z87.1.
 - 4. Provide protective personal equipment and clothing at no cost to the workers.

2.2 DECONTAMINATION UNIT

- A. Provide a temporary three-stage decontamination unit, attached in a leak-tight manner to each Contained Work Area. Decontamination units shall consist of a clean room equipped with separate lockers for each worker, a shower room, and an equipment locker room equipped with separate lockers for each worker.
- B. Shower specifications: Locate flow and temperature controls within the shower and be adjustable by the user. Hot water service may be secured from the building hot water system if available, but only with back-flow protection installed by the Contractor at the point of connection, and with prior notification and approval by the Owner. Should sufficient hot water be unavailable, the Contractor shall provide a minimum 40-gallon electric hot water heater with a minimum recovery rate of 20 gallons per hour. Water from the shower room shall not be allowed to wet the floor in the clean room.

2.3 WASTEWATER FILTERS

- A. Install the wastewater filters in a series of stages with the final filtration stage sufficient to meet discharge standard of 18 AAC 70 and/or any local sewage system discharge limit for lead. Size the wastewater pump for 1.25 times the shower head flowrate. Dispose of all filters as lead contaminated waste.

2.4 WARNING SIGNS AND TAPE

- A. Post warning signs and tape at the boundaries and entrances to lead and PCB disturbance and removal work areas. Signs required by other statutes, regulations, or ordinances may be posted in addition to, or in combination with, this warning sign. Conform warning signs and tape to the requirements of 29 CFR 1926.62.

2.5 WARNING LABELS

- A. Affix warning labels to all hazardous waste disposal containers as described in the Contractor's approved Solid Waste Disposal Plan. Conform labeling to 29 CFR 1926.62 and 49 CFR 100-199.

2.6 NEGATIVE PRESSURE EXHAUST SYSTEM

- A. Use the negative pressure exhaust systems to exhaust each contained work area where the PEL will or is expected to be exceeded. Operate the negative pressure exhaust system continuously (24 hours a day) during lead and PCB work. Select the negative pressure exhaust system equipment to provide a minimum of 4 air changes per hour under load within the work area. The negative pressure exhaust system shall have a minimum of two stages of pre-filtration ahead of the HEPA filter: The HEPA filter shall bear the UL-586 label. In no case shall the building ventilation system be used as the local exhaust for the contained work area. Terminate the exhaust outside of the building. The exhaust ventilation system equipment shall be equipped with lock-out protection to prevent operation without a HEPA filter properly installed. The exhaust system equipment shall be equipped with the following instrumentation: a static pressure gauge with low flow alarm, an elapsed time indicator, automatic shutdown capability in the event of a major rupture in the HEPA filter or blocked air discharge and an automatic re-start when power is restored after a power failure.

2.7 PRESSURE DIFFERENTIAL MONITORING EQUIPMENT

- A. Provide continuous monitoring of the pressure differential with an automatic recording instrument for each contained work area. Locate the instrument in a clean area where personnel have access to it without respiratory protection. The instrument shall be fitted with an alarm should the negative pressure drop below -0.02 inches of water column relative to the air outside containment.

2.8 TOOLS

- A. Vacuum cleaners shall be equipped with HEPA filters. Use only approved power tools to remove lead-containing and PCB-containing material. Do not use open-flame and electric element heat-gun type tools with temperatures in excess of 700° F to remove lead-containing material. For PCB-containing materials, avoid methods that generate high heat (exceeding 212° F/100°C) where possible to prevent the release of PCB vapors, unless specifically approved and controlled under a comprehensive site-specific plan. Remove all residual lead and PCB contamination from reusable tools being removed from lead and PCB disturbance or removal work areas. Electrical tools and equipment shall be UL listed.

2.9 AIR MONITORING EQUIPMENT

- A. The Contractor's IH shall select the air monitoring equipment to be used for the evaluation of airborne lead.

2.10 EXPENDABLE SUPPLIES

- A. Provide flame resistant 6-mil thick polyethylene sheet plastic shall be provided in widths necessary to minimize seams.

2.11 SAFETY DATA SHEETS

- A. Provide SDSs for all chemical materials brought onto the worksite.

2.12 OTHER ITEMS

- A. Provide other items, such as consumable materials, disposable and/or reusable cleaning equipment and hand tools, or miscellaneous construction equipment and materials, in sufficient quantity as necessary to fulfill and complete the requirements of the contract. Electrical equipment and supplies shall be UL listed.

2.13 ENCAPSULANTS

- A. Encapsulants shall contain no toxic or hazardous substances. Encapsulants shall be compatible with the products to which they are applied and be compatible with replacement products.

PART 3 EXECUTION

3.1 WORK AREAS

- A. Lead and PCB Control Areas: A control area, structure, or containment where lead-containing/PCB-containing materials are being disturbed. Critical barriers and/or physical boundaries shall be employed to isolate the lead and PCB control areas and to prevent migration of lead and PCB contamination and unauthorized entry of personnel.
- B. Contained Lead and PCB Work Area Requirements: Construct contained lead and PCB work areas as described in the Contractor's approved work plan. A contained lead and PCB work area is required whenever airborne lead and PCB levels cannot be maintained below the OSHA action level at the boundary of a lead and PCB work area.
- C. Building Ventilation System: Isolate, by air-tight seals, all building ventilation systems supplying air into or returning air from a lead and PCB control area or contained work area.
- D. Building Electrical Systems: Verify that the electrical service is deactivated, disconnected and locked out where necessary for wet washing and/or removal. Provide temporary electrical service, equipped with ground fault protection, where needed.

3.2 PERSONNEL PROTECTION PROCEDURES

- A. Initial Determination: An initial determination is required in the absence of acceptable prior exposure data in accordance with 29 CFR 1926.62. Establish an initial lead work area for each material to be disturbed and each disturbance procedure, if required. Isolate these lead work areas from the rest of the building. Personnel working in these areas shall wear respiratory protection and personal protective equipment as directed by the IH. Perform personal and work area air monitoring as directed by the IH. Operational decontamination facilities shall be available. Work performed shall be representative of the work to be done during the remainder of the project.
- B. Initial Exposure Assessment for PCBs: An initial exposure assessment shall be performed for all operations involving the disturbance or removal of suspected or known PCB-containing materials to determine the potential for employee exposure to airborne PCBs. The assessment shall consider the OSHA PELs for PCBs as specified in 29 CFR 1910.1000, Table Z-1, and other applicable OSHA standards (29 CFR 1910.134 for respiratory protection, 29 CFR 1910 Subpart I for PPE, or 29 CFR 1926 Subpart E for construction PPE). In the absence of acceptable prior exposure data for the specific tasks and materials, this assessment shall include personal air monitoring of employees performing representative tasks. The sampling and analytical methods used shall be appropriate for PCBs and conducted by a qualified Independent Testing Laboratory.
- C. Respirator Evaluation: Upgrading, downgrading, or not requiring respirators shall be recommended by the Contractor's IH based on the measured airborne lead-containing dust or fume concentrations. Immediately implement recommendations to upgrade the respiratory protection, followed by notification to the Owner. NOTE: Submit recommendations in writing to downgrade respirator type or not require respirators to the Owner for review and written approval prior to implementation.
- D. Decontamination Procedures: Worker and material decontamination procedures shall be as described in the Contractor's approved work plan. Worker decontamination shall be as directed by the Contractor's competent person.
- E. Work Stoppage: Stop work if the IH, the Owner, or a representative of a regulatory agency determines that the work is not in compliance with the Contractor's approved work plan, these specifications, or applicable laws and regulations. The Contractor shall stop work and notify the Owner whenever:
 - 1. The measured concentrations of lead outside the lead control area equal or exceed $30 \mu\text{g}/\text{m}^3$ for airborne lead or $5.0 \mu\text{g}/\text{ft}^2$ for lead dust on surfaces outside of the work area.
 - 2. The measured concentrations of PCB outside the PCB control area equal or exceed $1 \text{ mg}/\text{m}^3$ for airborne PCBs (with 42% chlorine) or $0.5 \text{ mg}/\text{m}^3$ for airborne PCBs (with 54% chlorine), exceed site-specific clearance criteria, or applicable regulatory limits of PCB dust on surfaces outside of the work area.

3. When such work stoppage occurs, the cause of the contamination shall be corrected, and the damaged or contaminated area shall be restored to its original decontaminated condition by the Contractor at no expense to the Owner. The Contractor is responsible for removing dusts and debris that were generated as a result of his work.
- F. The Contractor shall adhere to all applicable regulations regarding entry into confined spaces.

3.3 LEAD AND PCB DISTURBANCE AND REMOVAL PROCEDURES

- A. General: Perform lead and PCB disturbance or removal work in accordance with the Contractor's approved work plan, applicable regulations and this specification.
- B. Pre-Cleaning: Removal of existing loose paint chips is included in the scope of work. Pre-clean surfaces by HEPA vacuum and wet washing/wiping prior to the establishment of a work area.

3.4 MONITORING AND TESTING

- A. Conduct daily sampling in accordance with the Contractor's accepted Lead and PCB SAP and this specification.
- B. The Owner may conduct air monitoring in the Contractor's work areas and on the Contractor's employees.
- C. Perform environmental air monitoring outside the lead and PCB work area for each lead and PCB work area without a negative initial determination (for lead) and initial exposure assessment (for PCBs). Include at least one sample immediately outside the entrance to the work area.
- D. Perform dust wipe sampling for each lead and PCB work area without a negative initial determination and negative initial exposure assessment. Include at least one sample immediately outside the entrance to the work area daily.
- E. Take personnel samples in accordance with 29 CFR 1926.62. Personal samples for an employee will include a minimum of two samples per 8-hour shift. Employees will be monitored at the rate of at least one employee for every eight people performing each task in each work area. Persons performing separate tasks or in separate lead work areas shall be sampled separately.

3.5 DISPOSAL

- A. Sampling of Waste Materials: The Contractor shall test waste materials according to 40 CFR 261 and the disposal site's permit to determine if they are hazardous waste and to dispose of them accordingly. Collect, package and transport to an EPA approved Hazardous Waste Disposal Site all bulk debris, loose paint chips, fines, dust from HEPA filters and vacuum bags, unfiltered wastewater, water filter cartridges, disposable personal protective equipment (including respirator filters, poly, and tape) which do not have TCLP test results that classify the material as non-regulated for lead and/or PCBs.
- B. Waste Disposal: Within Alaska, PCB concentrations between 1.0-ppm and 50-ppm are treated as "polluted soil" per regulation. ADEC regulations allow the disposal of materials with a PCB concentration of less than 1.0-ppm, however disposal facilities in Alaska have refused to accept materials containing any detectable PCBs. The contractor must verify with the chosen disposal landfill operator that the landfill permit accepts PCB waste below 1.0-ppm prior to the start of demolition.
- C. Waste Storage: Temporarily store solid waste only as described in the approved work plan.

3.6 FINAL CLEANING AND VISUAL INSPECTION

- A. Perform a final cleaning and visual inspection of each lead and PCB control area prior to release to unprotected workers in accordance with the Contractor's approved work plan. Clean the lead and PCB control areas by vacuuming with a HEPA filtered vacuum cleaner, wet mopping or wet wiping. Do not dry sweep or use pressurized air to clean up the area. A final visual inspection report shall be provided verifying that all lead and PCB disturbance required by the contract has been completed and that all visible dust and debris subject to disturbance by the planned work under this contract have been removed and the area HEPA vacuumed, wet mopped or wet wiped.

3.7 WORK AREA CLEARANCE TESTING

- A. Work Area Clearance Testing – General Requirements:
 - 1. Work area clearance testing by the Contractor is required for each work area where lead and/or PCB-containing materials have been disturbed or removed, or where lead or PCB concentrations may have exceeded applicable action levels or cleanup standards.
 - 2. Clearance testing shall be performed only after a visual inspection report by the Contractor's IH Technician has documented that the work area is clean and that all specified abatement activities have been completed.

3. All surfaces must be free of visible dust, debris, and residue from lead or PCB disturbance. The area shall be HEPA vacuumed, wet mopped, or wet wiped as appropriate.
- B. Lead Clearance Testing:
1. Visual Inspection: A visual inspection report by the Contractor's IH Technician verifying that all lead disturbance required by the contract has been completed and that all visible lead-containing dust and debris subject to disturbance by the planned work under this contract have been removed. All surfaces shall appear visibly clean.
 2. Dust Wipe Sampling: (3) lead wipes sample results from within the lead control area per the Contractor's approved work plan and in accordance with NIOSH method 9100. Clearance levels shall be 5.0 $\mu\text{g}/\text{ft}^2$ for wipes.
- C. PCB Clearance Testing:
1. Visual Inspection: A visual inspection report by the Contractor's IH Technician verifying that all PCB disturbance required by the contract has been completed and that all visible PCB-containing dust and debris subject to disturbance by the planned work under this contract have been removed. All surfaces shall appear visibly clean.
 2. Dust Wipe Sampling: Collect three PCB surface wipe samples from non-porous surfaces within the PCB control area(s) in accordance with the Contractor's approved work plan and EPA guidance under 40 CFR 761. Clearance levels shall be less than 10 $\mu\text{g}/100 \text{ cm}^2$ (on non-porous surfaces in occupied/office spaces) or less than 100 $\mu\text{g}/100 \text{ cm}^2$ (on non-porous surfaces in storage rooms).
- D. The Owner may conduct concurrent clearance testing.
- E. Work area barriers or containments shall not be removed until clearance testing results are reviewed and approved by the Owner.
- 3.8 SUBSTANTIAL COMPLETION
- A. After the work area barriers and temporary construction and equipment have been removed, the Contractor shall inspect the work area to verify that no lead and/or PCB debris, contaminated water, or other residue remains. Any remaining residue shall be cleaned up using HEPA vacuum cleaners and wet wiping methods.

- B. The Contractor shall certify that the work area has been cleaned of all lead and PCBs in compliance with the contract.
- C. Costs of restoration of damage to adjacent areas or properties shall be borne by the Contractor.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 20 01 00 - OPERATION AND MAINTENANCE FOR MECHANICAL

- A. This Section covers form, content, and submittal of mechanical system Operation and Maintenance Manuals.

PART 2 PRODUCTS

2.1 FORM

- A. Arrange operation and maintenance data sequentially by Specification Section.
- B. Provide two indexes at the front of the binder that locates individual items by tab number. The first by Specification Section. The second, an alphabetical index of all items without regard to Specification Section.
- C. Separate each item with consecutively numbered heavy stock divider sheets with plastic index tab. Type item number on both sides of paper inserts.
- D. Precede each item with a completed Item Data Sheet. See 01 33 00 for required format.
- E. Material included shall indicate the specific item(s) utilized for this Project. Delete or cross out all other items.
- F. Provide complete operation and maintenance manual submittals. Partial or incomplete submittals required under this Section will be returned without review.

2.2 DATA

- A. Provide data for all items, equipment, and equipment components specified or indicated under this Division, so that the Owner's maintenance personnel will have complete service and replacement information required for routine maintenance and repair and to provide maximum usable life. Include data not only for maintainable and repairable items, but also for replaceable but not repairable items. Typical items for which information is required include:
 - 1. Equipment including all components and accessories such as motors, pulleys, belts, couplings, switches, etc.
 - 2. Valves, meters, steam traps, thermometers, pressure gauges, strainers, filters, and other piping accessories.

3. Heating system terminal units including finned tube radiation, unit heaters, etc.
 4. Control components and a complete set of As-built point-to-point Control Drawings. Provide a copy of the Sequence of Operations with Control Drawings.
- B. Include the following data for each item as applicable. Some of these data can be extracted from equipment review submittals and included with the Operation and Maintenance Manuals.
1. Manufacturer's catalog literature and illustrations.
 2. Operating characteristics including capacity data, performance curves, flow rates, pressure drops, etc.
 3. Electrical characteristics and wiring diagrams.
 4. Dimensions and connection sizes.
 5. Installation and adjustment instructions, requirements, and recommendations.
 6. Parts lists and assembly Drawings.
 7. Maintenance, operational, and troubleshooting instructions.
 8. Warranty data.
- C. Data shall be provided by the equipment manufacturer or supplier.
- D. Data required for all component items of equipment whether or not the components are products of the equipment manufacturer.
- E. All material must be clearly readable. "Faxed" then photocopied information is not acceptable.
- F. Include a chart, neatly typed and arranged by system, summarizing periodic inspections and maintenance recommended by equipment manufacturers and/or required to properly maintain the facility's new mechanical systems. The periodic maintenance summary chart shall include equipment name, identification symbol, location, type of maintenance or inspection required, and recommended time interval.
- G. Include an equipment schedule, neatly typed and arranged by system, listing new equipment with equipment symbol, nomenclature, function and area served, location, manufacturer, nameplate data including model and serial number and motor data including full load amps, horsepower, volts and phase.
- H. Include a valve schedule, neatly typed and arranged by system, listing new valve tags with information required on valve tag plus location and normal position, open or closed.

2.3 BINDING

- A. Bind the Operation and Maintenance Manuals in three ring, D-ring style binders with page lifters and vinyl covers. Expandable catalog type two hole binders with soft board covers and metal prong fasteners will not be accepted.
- B. Provide multiple binders as required to limit single binder thickness to three inches. Divide binders at logical points. Do not overfill binders.
- C. Controls system Operation and Maintenance Manuals and fire protection system Operation and Maintenance Manuals may be bound and submitted for review as separate manuals.
- D. Label the front cover and end panel. Label to include Project title, Project number, date, and facility name.

PART 3 EXECUTION

3.1 REQUIRED COPIES AND TIMING

- A. Review Submittals:
 - 1. Submit one electronic copy (PDF format) of the Operation and Maintenance Manual for review and acceptance by the Contracting Officer. Electronically Index (Bookmark) each section and item, by item data number and name within the electronic submittal.
 - 2. Submit for review not less than thirty days prior to Substantial Completion Inspection.
- B. Final Operation and Maintenance Manuals:
 - 1. Provide five complete, reviewed, corrected and accepted Operation and Maintenance Manuals to the Contracting Officer with a minimum of five working days prior to Project Substantial Completion Inspection and 5 working days prior to any scheduled training on equipment covered by the Operations and Maintenance Manual.
 - 2. Provide three complete digital copy's (PDF format) of the accepted Operation and Maintenance Manuals to the Contracting Officer as part of the Final Operation and Maintenance Manual submittal. Provide digital copies on Compact Disc (CD) or USB compatible memory card (Flash).

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 20 05 00 - COMMON WORK RESULTS

- A. This Section covers general mechanical requirements for Work covered under Divisions 20, 21, 22, 23 and 33.
- B. All Work and services specifically covered under this Division are supplementary to that covered under other Divisions of these Contract Documents. The requirements of this Division which are more stringent than those covered under other parts of these Contract Documents apply to Work covered under this Division.
- C. All incidental Work required but not specified under this Division shall comply with the Division in which it is specified.
- D. Review the Drawings and Specifications of all other Divisions for additional Work under Division 20.

1.2 GENERAL REQUIREMENTS

- A. Provide the Owner with complete, coordinated, operating, balanced, tested, and adjusted mechanical systems.
- B. Place all equipment in operation and instruct the Owner's maintenance personnel as to the proper operation, periodic maintenance, and lubrication of new mechanical equipment and systems.
- C. The Drawings are somewhat diagrammatic and do not attempt to show all offsets or fittings required for installation of the mechanical system. Furnish and install pipes and ducts with fittings required for complete and proper installation of mechanical systems specified or required under this Division.
- D. Provide piping, equipment, and accessories indicated on the Drawings unless it is specifically indicated that the piping, ductwork, equipment, or accessory exists.
- E. Install piping and equipment in accordance with manufacturer's recommendations, with accessories recommended by the manufacturer for service intended, and with accessories indicated. Should recommendations conflict with Contract Documents, contact the Contracting Officer for clarification before proceeding.
- F. Coordinate the installation of the mechanical systems with the Work of other trades and existing conditions. Route mechanical systems as required to avoid interference with the Work of other trades and existing conditions.

- G. Provide access to concealed piping accessories, duct accessories, and equipment requiring access for periodic maintenance, inspection, replacement, or adjustment. Furnish access panels/doors of the proper type and size for the application. See Division 08.
- H. Do not scale the Mechanical Drawings. Verify dimensions as construction progresses.
- I. Refer to the Architectural and Structural Drawings in regard to partition thicknesses, dimensions and other details of the building construction.
- J. Report any errors, discrepancies, or ambiguities to the Contracting Officer, who will answer all questions and interpret the intended meaning of these Contract Documents. Accept Contracting Officer's interpretation as final.
- K. Perform Work in a neat and workmanlike manner with skilled craftsmen specializing in said Work.
- L. Provide new equipment and materials direct from the manufacturer unless specifically indicated otherwise. Remanufactured equipment and materials are specifically not acceptable.
- M. Provide the product of only one manufacturer for each item or type of item provided in quantity.
- N. Where the selection of materials or methods is left to the discretion of the Contractor, faithfully pursue the use of the best available materials or methods suitable for the purpose intended.
- O. Install Owner furnished fixtures, appliances, and equipment indicated to be Contractor installed, and furnish and install all piping and/or ductwork required to connect Owner furnished fixtures, appliances, and equipment to the Mechanical systems, in accordance with the fixture, appliance, or equipment manufacturer's recommendations and as indicated.

1.3 LOCAL CONDITIONS

- A. Bidders shall familiarize themselves with the Contract Documents and existing conditions which affect Work required by the Contract Documents. It will be assumed that bidders have done a personal examination of the jobsite and existing conditions.
- B. Failure to visit the jobsite will in no way relieve the successful bidder from the necessity of furnishing any materials or performing any Work that may be required to complete the Work in accordance with the Contract Documents with no additional cost to the Owner.

1.4 PERMITS, TESTING, AND INSPECTIONS

- A. Apply, obtain, pay for, and comply with the requirements of all permits, fees and inspections by public authorities required for the Work covered under this Division of the Specifications.
- B. Transmit copies of permit applications, permits received, and public authority inspection reports to the Contracting Officer.
- C. Test mechanical systems in accordance with the most restrictive procedures as defined under applicable codes or as specified elsewhere under this Division.
 - 1. Provide a minimum of three working days' notice to Contracting Officer and public authorities prior to performance of test.
 - 2. If less than required notice is given, the Contracting Officer may require the Contractor to repeat the test at no additional cost to the Owner.
 - 3. Test Work prior to insulating or concealing. If less than required notice is given prior to insulating or concealing, the Contracting Officer may require the Contractor to uncover such Work for inspection and recover same at no additional cost to the Owner.
 - 4. Submit certificate of compliance for all tests indicating system tested, results of tests, witnesses and dates prior to calling for Substantial Completion and final inspections.
 - 5. During testing, isolate piping system equipment and accessories that are not rated to withstand test pressures or perform test prior to connection of such equipment and accessories to the piping system.
- D. Substantial Completion and Final Inspections:
 - 1. Provide minimum of 14 calendar days' notice to Contracting Officer and public authorities of intent to have Work ready for inspection. Confirm that Work will be ready for inspection a minimum of 3 working days' notice prior to requested inspection.
 - 2. Prior to inspection:
 - a. Deliver to the Contracting Officer required equipment, Drawings, and records.
 - b. Clean fixtures and equipment. Remove manufacturer's stickers and leave free of dust and dirt.
 - c. Remove boxes, scrap, and other debris.

- d. Touch up holidays or damaged painted surfaces.
 - e. Contractor's Mechanical Administrator, licensed by the State of Alaska, shall review mechanical systems installation for conformance with Contract Documents. With request for inspection, Contractor's Mechanical Administrator shall verify in writing that this review has been performed and note anything not conforming to Contract Documents.
 - f. With request for re-inspection of Work previously inspected, provide the Owner's previous inspection's deficiency list accompanied by an item-by-item statement of measures taken to correct the previously listed deficiencies.
 - g. Deliver to Owner personnel all special tools and devices furnished by the manufacturer with items, specialties or equipment to allow installation, disassembly, adjustment, repair or maintenance. Identify special tools or devices as to items to which it is applicable.
 - h. Provide mechanical receivables that the Owner is to receive upon completion of the Project. Turn over an inventory list of materials provided for the Owner's use to the Contracting Officer prior to scheduling substantial completion and final inspections.
 - i. Deliver to the Contracting Officer a Certificate of Instruction signed by all Owner personnel receiving instruction, all Contractor personnel providing instruction, and indicating dates of instruction.
3. During inspection:
- a. Provide a complete and up-to-date set of current record drawings for use during inspection.
 - b. Provide complete operating systems suitable for the season.
 - c. Demonstrate that the mechanical system performs in accordance with the Contract Documents. Provide material and personnel required to perform the demonstration.
 - d. Provide assistance to inspection personnel required for a complete and thorough inspection.

1.5 CODES, ORDINANCES, AND STANDARDS

- A. Federal, State and local Codes and Ordinances take precedence over these Specifications and Drawings where conflicts occur unless the Drawings or Specifications call for more stringent requirements. Notify the Contracting Officer in writing of conflicts.

- B. Follow latest adopted editions of Code of Federal Regulations, Alaska Administrative Code, International Building Code, International Mechanical Code, International Fuel Gas Code, Uniform Plumbing Code, International Fire Code, National Electrical Code, ADA Accessibility Guidelines, NFPA, ASME, NEMA, ASHRAE, SMACNA, etc. as applicable.
- C. Comply with all applicable laws, building and construction codes, OSHA Safety and Health Regulations and applicable requirements of any governmental agency under whose jurisdiction this Work is being performed.

1.6 COORDINATION WITH LOCAL AUTHORITIES

- A. Coordinate connection of new utilities to existing Aurora Energy utilities system including required utility shut downs with utility engineers. Keep required shut down periods to a minimum. Make connections as indicated and in accordance with Aurora Energy requirements.

1.7 MECHANICAL COMPLIANCE RECORD

- A. Record the performance of all tests, sterilization, cleaning, flushing and refilling of mechanical systems required under this Division.
- B. Include date, time and time interval, test results, brief description of method of tests, and witnesses.
- C. Submit this record to the Contracting Officer prior to scheduling Substantial Completion and final inspections.

1.8 INSTRUCTION OF OWNER'S PERSONNEL

- A. Instruct designated Owner personnel in the proper operation, periodic maintenance and lubrication of the project's mechanical systems, equipment and accessories utilizing an accepted Operations and Maintenance Manual.
- B. As instructors, include journeymen plumbers, pipe fitters, sheet metal workers, electricians, and control technicians, each fully knowledgeable of the project's mechanical systems and equipment.
- C. Instruct only those Owner personnel specifically designated by the Contracting Officer. Instruction of other Owner personnel will not meet the requirements of this Section.
- D. Include system operations; periodic maintenance including locations and techniques; periodic lubrication including materials, methods and locations; location of concealed valves, instruments, dampers, etc.; location of electrical breakers and disconnects associated with mechanical equipment; and location of control items.

- E. Include a thorough orientation of the Control Drawings accompanied by a demonstration of the interrelationships of all control devices including sensors, relays, controllers, operators, etc. Locate control equipment shown in the Control Drawings and demonstrate full operation of control devices and systems.
- F. Instruct Owner personnel for a minimum of eight hours plus that required by other sections of this Division of the Specifications.
- G. Schedule the instruction period in the same manner as for system tests. The Contractor is obligated to only one instruction period. The instruction period may be divided into more than one period with the concurrence of the Contracting Officer.

1.9 RECORD DOCUMENTS

- A. When submitting record documents required by Section 01 70 00 "Contract Closeout," also submit reproducible As-built Drawings of Contractor designed systems such as fire suppression systems and control systems.
- B. Add the following to the list of items required by Section 01 70 00 "General Requirements" that be legibly marked on Contract Drawings:
 - 1. Changes made to equipment identification assignments, replacing Contract Document assigned equipment designations, at each location that designation occurs.
 - 2. Valve numbering for each valve assigned a number at each location shown on the Drawings.
- C. Correct Record Documents as required and deliver to the Contracting Officer. Documents shall bear a statement signed and dated by a legal representative of the Contractor indicating that the Record Documents reflect "as-built" conditions.

1.10 WARRANTY

- A. All manufacturer and supplier standard equipment, item or accessory warranties covered under this Division shall be the Contractor's responsibility under Project warranty period.
- B. Equipment, item, or accessory warranties shall commence upon the date of Final Acceptance by the Owner.
- C. Transfer all manufacturer and supplier standard equipment, item or accessory warranties to the Owner upon expiration of Project warranty period.
- D. Any warranties, more stringent than manufacturer's standard, specified or indicated under this Division remain the responsibility of the Contractor before and after expiration of Project warranty period.

- E. Minimum manufacturer or supplier warranty is that of the manufacturer or supplier used as the basis of design.

1.11 MECHANICAL WORK IN EXISTING FACILITIES

- A. Carefully lay out Work in advance.
- B. Verify existing conditions affecting Work, including existing sizes and materials indicated prior to beginning Work or ordering materials that are affected by existing conditions. Beginning of Work means acceptance of existing conditions. Match existing products and Work unless otherwise noted. Notify Contracting Officer of conflicts in writing.
- C. Verify locations and elevations of utilities that are crossed or connected to prior to installation of new Work.
- D. When portions of existing mechanical, electrical, structural, etc. conditions are shown, it is not meant to indicate that all of such systems are shown.
- E. Where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings or other surfaces is necessary for the proper installation, support or anchorage of the mechanical equipment, piping, or ductwork, carefully perform this Work and patch to match existing conditions.
- F. Repair any damage to building, piping, or equipment with skilled mechanics of the appropriate trade.
- G. Coordinate connection of new services to existing building systems, including required systems shut downs, with the Contracting Officer. Limit required shut down periods to a minimum. Isolate, drain, and refill existing systems as required to accommodate Work. Restore existing systems to full operational condition.
- H. Cut, move, or remove existing items as necessary for installation of new Work and restore and replace at completion.
- I. Remove from site removed materials unless otherwise indicated that the material is to be salvaged for the Owner.
- J. Remove, cut, and patch in a manner to minimize damage and to provide means of restoring items to original conditions.
- K. Replace existing mechanical insulation that is removed to accomplish Work with new insulation matching existing.

- L. Remove piping and ductwork connected to or serving fixtures or equipment being removed and other piping and ductwork being removed, back to its main or connection to a still active branch and cap. Remove associated hangers and supports. Patch, to match existing, pipe or ductwork insulation on mains at removed branch lines. If such piping or ductwork is connected to mains or still active branches in areas that are not accessible or that are not being made accessible, then remove piping and ductwork into area of non-accessibility and cap. Patch, to match existing, openings in walls, ceilings, or floors left or created as a result of piping or ductwork removal.
- M. Remove piping, other than waste and vent piping, that is being removed and that extends below slab-on-grade to below top of slab, cap pipe, and patch slab to match existing.

1.12 EXPOSED PIPING, DUCTWORK, EQUIPMENT, AND ACCESSORIES

- A. Exposed piping, ductwork, equipment, and accessories have been sized, routed, and coordinated to provide a neat, clean architectural appearance.
- B. Fabricate and install exposed piping, ductwork, equipment, and accessories so that finished product exhibits a quality, craftsmanship, and appearance aesthetically acceptable to the Contracting Officer and suitable for final finishing. Finishing covered under Division 09 00 00.

1.13 ASBESTOS FREE MECHANICAL SYSTEMS

- A. Provide mechanical systems that do not contain asbestos or asbestos-containing materials.

1.14 PROJECT COMPLETION DOCUMENTATION AND MATERIAL TURN OVER

- A. See individual specification sections for required project completion documentation, and required maintenance or spare parts to be turned over to the Contracting Officer, including the following:
 - 1. Record documents and reports:
 - a. Record documents – Section 20 05 00 “Common Work Results.”
 - b. Testing, Adjusting and Balancing Report – Section 23 05 93 “Testing, Adjusting and Balancing for HVAC.”
 - c. Conformed O&M manuals – Section 20 01 00 “Operation and Maintenance for Mechanical.”
 - d. Test performance records for sterilization, cleaning, flushing and refilling of mechanical systems – Section 20 05 00 “Common Work Results.”

- e. Conformed control O&M – Section 23 09 23 “Direct Digital Control Systems.”
 - f. Control system database backup flash drive – Section 23 09 23 “Direct Digital Control Systems.”
2. Training completion record:
- a. Mechanical instructions training completion record – Section 20 05 00 “Common Work Results.”
 - b. Mechanical access panels and marker familiarization training completion record – Section 20 05 00 “Common Work Results.”
 - c. Digital control systems training completion record – Section 23 09 23 “Direct Digital Control Systems.”
3. Equipment and Devices:
- a. Glycol testing devices – Section 23 21 13 “Hydronic Piping.”
 - b. DDC Control Workstations – Section 23 09 23 “Direct Digital Control Systems.”
 - c. Flow test kit – Section 23 05 00 “Common Work Results for HVAC”.
4. Extra Stock:
- a. Control system spare fuses – Section 23 09 23 “Direct Digital Control Systems.”

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 20 05 11 - COMMON SUBMITTAL REQUIREMENTS FOR MECHANICAL

- A. This Section covers required mechanical equipment review submittals of material, equipment, items and accessories covered under this Division for review by the Contracting Officer to determine conformance with the Project design concepts and Contract documents prior to commencement of Work under this Division.

PART 2 PRODUCTS

2.1 FORM

- A. Each equipment review submittal or resubmittal shall be indexed, tabbed, and bound copies of data, Drawings, and materials lists. Alphabetize the index by item name and list the Specification Section and item number under which each item is submitted.
- B. Submittal information is required for all material and equipment specified or indicated on the Drawings.
- C. Organize submittals by Specification Section. Separate each Section by a heavy stock divider sheet with plastic index tab. Type Specification Section numbers on both sides of paper inserts.
- D. Identify each item of the submittal with an item number. Number the first item within a Specification Section "#1", the second item within a Specification Section "2", and so forth. Restart numbering sequence with each Specification Section. Further separate Section 23 09 23 "Direct Digital Control System for HVAC" by divider sheets with plastic index tabs between each item. Type item numbers on both sides of paper inserts.
- E. Include equipment indicated on the Drawings, but not covered by a Specification Section, with the appropriate volume under a tab marked "Drawings." Rules for item numbering and item data sheets apply.
- F. Precede each item with a completed Item Data Sheet. See required format attached to the end of this Specification Section.
- G. Material submitted shall indicate the specific item(s) proposed for this Project. Delete or cross out all other items.

- H. The mechanical equipment review submittal may be divided and submitted in the following volumes. Simultaneous submittal of all volumes is not required. Further division of the submittal into separate volumes is not permitted.
 - 1. Section 20.
 - 2. Section 23 except Section 23 09 23 "Direct Digital Control System for HVAC."
 - 3. Section 23 09 23 "Direct Digital Control System for HVAC."
- I. Include application, hanger, insulation, piping, valve, and damper schedules as indicated in submittal requirements, example schedule format attached indicating "Application Schedule."
- J. Long lead mechanical equipment may be submitted for review in a separate volume. Include all long lead items in a single volume that is indexed, tabbed and bound as required for regular mechanical equipment review submittals. Maintain the long lead item submittal as a separate volume throughout the submittal review process; do not incorporate into the regular mechanical equipment review volumes.
- K. Each submittal or resubmittal of each volume shall be complete and shall contain all previously submitted material except that being replaced by new or revised material which shall be removed. Partial or improperly indexed or tabbed submittals or resubmittals shall be rejected without review or comment.
- L. With each resubmittal include a complete summary of all changes and additions made to the equipment review submittal since the previous submittal. Only those items included in the summary will be reviewed with the resubmitted package.
- M. Do not submit "updates" for previous submittal packages with resubmittals. Previous submittals will not be updated.

2.2 DATA

- A. Include the following data for each item as applicable:
 - 1. Manufacturer and model number.
 - 2. Drawing equipment number.
 - 3. Catalog literature.
 - 4. Operating characteristics including capacity data, performance curves, flow rates, pressure drops, etc.
 - 5. Electrical characteristics and wiring diagrams.
 - 6. Dimensions and connection sizes.

7. Installation and adjustment instructions, requirements and recommendations.
 8. Color samples.
 9. Warranty data.
- B. A list of minimum submittals required is provided in each Section. These lists are not necessarily complete or all-inclusive and the Contractor is responsible for complete submittal.

2.3 BINDING

- A. Bind the mechanical equipment review submittals in three ring, D-ring style binders with page lifters and vinyl covers. Expandable catalog type two-hole binders with soft board covers and metal prong fasteners will not be accepted.
- B. Provide multiple binders as required to limit single binder thickness to 3 inches. Divide binders at logical points.
- C. Label the front cover and end panel. Label to include Project title, Project number, date, and facility name.

PART 3 EXECUTION

3.1 REQUIRED COPIES AND TIMING

- A. Submit one electronic copy (PDF format) of the Mechanical Equipment Review Submittal or resubmittal for review and acceptance by the Contracting Officer. Electronically Index (Bookmark) each section and item within the electronic submittal.
- B. Materials submitted shall be reviewed and accepted by the Contracting Officer before Contractor releases material for fabrication or shipment.

END OF SECTION

ATTACHMENT: ITEM DATA SHEET

ATTACHMENT: APPLICATIONS SCHEDULE

ITEM DATA SHEET

1. Item number:
2. Item name/Drawing equipment number:
3. Specification section/Drawing number:
4. Manufacturer/model number:
5. Use and location: (1)
6. Spare parts source:
7. Providers of warranty service:
8. Proposed deviations from the Contract Documents: (2)
9. Other Contractor comments:
10. Contractor Certification: (3)

The undersigned Contractor Representative certifies that he has reviewed the attached information and has determined that the proposed material complies with the requirements of the Contract Documents; he has coordinated installation of the material with the work of other trades and existing conditions; he has determined and verified field measurements, field construction criteria, manufacturer's installation requirements affecting the proposed material; and has notified the Contracting Officer of conflicts.

Contractor Representative's Signature

- (1) Unless otherwise indicated, provide this information only when the product's use and location is not obvious. Provide this information for all items provided under Specification Sections 21 13 00 "Fire Suppression Sprinkler System" and 23 09 23 "Direct Digital Control Systems for HVAC."
- (2) If this section is left blank it will be assumed that proposed equipment is exactly as specified and indicated on the Drawings.
- (3) The Contractor referenced here is the General Contractor for the project. The signature of a subcontractor representative is not acceptable.

APPLICATION SCHEDULE (EXAMPLE)

APPLICATION	PRODUCT	MATERIAL	SIZE

Contractor Comments:

PART 1 GENERAL

1.1 SCOPE: SECTION 20 05 13 - COMMON MOTOR REQUIREMENTS FOR MECHANICAL

- A. This Section covers selection and installation of electric motors and starters provided under this Division as an integral part of specified equipment.

PART 2 PRODUCTS

2.1 ELECTRIC MOTORS

- A. Provide electric motor-driven equipment being furnished and installed under Division 22 and 23, complete with electric motors unless otherwise indicated. US Motors, TECO Westinghouse, ABB/Baldor, or equal.
- B. Motor bearings: Ball type, permanently lubricated and sealed or greased with zerk type lubricating fittings extended to an easily accessible, single point location for field servicing. 100,000-hour, L-10 life.
- C. Except for direct connected motors, provide motors complete with adjustable slide rails.
- D. Single speed, 1750 RPM unless indicated otherwise.
- E. Sized to meet the horsepower requirements of driven unit at design characteristics including all start-up, V-belt and/or drive and coupling losses, which are incurred without loading the motor beyond its nameplate horsepower rating. Minimum motor size shall be that scheduled or otherwise indicated.
- F. Provide with motor horsepower nameplate ratings not less than 110 percent of the driven unit brake horsepower requirements where V-belt drives are employed.
- G. Rated for continuous duty at 100 percent of rated capacity with temperature rise based on an ambient temperature of 40 degrees C.
- H. Single phase electric motors: Thermally protected, open drip proof, unless otherwise required to meet UL listing for use to which it is put or location in which it is installed. Capacitor start-capacitor run type or of equal high efficiency design, when commercially available. When unavailable, manufacturer's standard. Designed for use with indicated voltage, 60 Hertz alternating current.

- I. Three phase electric motors: Open drip proof, unless otherwise indicated or unless otherwise required to meet UL listing for use to which it is put or location in which it is installed. Squirrel cage induction type, designed for use with indicated voltage, 3-phase, 60 Hertz alternating current.
- J. Provide premium efficiency rated motors with base mounted circulating pumps and air handling equipment requiring motors one horsepower and larger. Baldor, TECO Westinghouse, U.S. Motor, or equal.
- K. Electronically commutated motors (ECM): Brushless permanent magnet design incorporating an integral electronic speed controller. Provide with Permanently lubricated with heavy duty bearings to match fan or pump load and pre-wired to the specific voltage and phase. Internal motor circuitry shall convert AC power supplied to the equipment to DC power to operate the motor.
- L. Hostile Environment Motors: Corrosion resistant epoxy finish, extra-large cast iron conduit box, Forsheda shaft seal on frame size 254T and larger, copper windings, stainless steel shaft, Class F insulation.
- M. Motors for equipment served by variable frequency drives:
- N. NEMA rated, inverter compatible, premium efficiency suitable for VFD operation, 1750 RPM, squirrel cage-induction motors. Baldor, TECO Westinghouse, U.S. Motor or equal.
- O. Compatible with variable frequency drive specified. Rated for minimum 10:1 turndown under variable torque conditions.
 - 1. 1.15 service factor (sine wave), 1.0 service factor pulse width modulated power.
 - 2. Moisture resistant, 200 degree C rated copper windings. Class F insulation materials with Class B rise meeting NEMA section MG1 part 31.4.4.2 for variable frequency drive operation.
 - 3. Efficiency: Meet or Exceed NEMA minimum efficiencies listed in MG1-1993 12.58.2 efficiency tables as tested in accordance with MG-1993 12.58.1.
 - 4. Motor bearings: Ball type, permanently lubricated and sealed or greased with zerk type lubricating fittings extended to an easily accessible, single point location for field servicing. Provide bearings with 100,000-hour, L-10 life.
 - 5. Cast iron frame, end plates, and fan cover.
 - 6. Oversized, gasketed, cast iron conduit box.
 - 7. Polypropylene, bi-directional fan, keyed to motor shaft.

2.2 MAGNETIC STARTERS

- A. Provided under Division 26, except where specifically described or indicated as being provided as a part of the equipment specified under this Division.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Conform to the requirements of Division 26 and the National Electric Code.
- B. Mount motors driving vibration isolated equipment on the same rigid frame and isolated with associated equipment.

3.2 OPERATION

- A. Motors shall draw less than nameplate amperage (not service factor amperage) when operating driven equipment within both mechanical and electrical design parameters for this Project.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 20 05 29 - HANGERS AND SUPPORTS FOR MECHANICAL

- A. This Section covers selection, installation, and adjustment of equipment and material used to hang and/or support mechanical systems and equipment.

1.2 SUBMITTALS

- A. Manufacturer's Data:
1. Catalog Cuts and Selections for equipment and accessory items.
 2. Submit concrete anchors used in each application with installation instructions and ICC evaluation report or other third-party test report showing seismic rating (where applicable).
- B. Application Schedule: Submit a schedule of hangers and supports listing the application, product, material, and size proposed for each application.
- C. Test Reports:
1. Third party reports or certifications where indicated.
 2. Copy of the standard form used for Special Inspection of concrete anchors.
- D. Shop Drawings for fabricated pipe or equipment hangers or supports including:
1. Dimensions.
 2. Construction details.
 3. Materials.
 4. Deflection for spring hangers.
 5. Rated or design load, actual load and safety factors.
 6. Applications.

PART 2 PRODUCTS

2.1 GENERAL

- A. Provide factory standard hangers and supports complete with necessary inserts, bolts, nuts, rods, washers, and other accessories.
- B. Acceptable manufacturers: B-Line, Anvil, Tolco or equal.

2.2 PIPE HANGERS

- A. Pipe hangers placed in direct contact with pipe:
 - 1. Pipe hangers for 8 inches and smaller cast iron and steel pipe: Swivel loop style, galvanized carbon steel, similar to B-Line Figure 2 .
 - 2. Pipe hangers for 6 inches and smaller copper pipe: Swivel loop style, carbon steel, epoxy coated or felt lined, copper colored Similar to B-Line Figure 200F .
 - 3. Pipe hangers for larger than 8 inches cast iron and steel pipe: Clevis ring style, electro-galvanized carbon steel similar to B-Line B3100 .
- B. Pipe hanger placed around insulation:
 - 1. Clevis ring style, electro-galvanized carbon steel similar to B-Line B3100 .
 - 2. J-Hanger, electro-plated steel, used with B-Line B3151 shield. B-Line B3690 or similar.
 - 3. Adjustable band hanger, pre-galvanized steel, used with B-Line B3151 shield. B-Line 3170 or similar.

2.3 RISER CLAMPS

- A. Riser clamps for cast iron and steel pipe: Electro-galvanized carbon steel. Similar to B-Line B3373.
- B. Riser clamps for copper pipe: Copper-electro plated carbon steel similar to B-Line B33373CT.
- C. Riser clamps for DWV pipe: Carbon steel. Similar to B-Line B3373 .
- D. Riser clamps for plastic, glass, aluminum, brass, stainless, etc. pipe: Polyvinyl coated carbon steel similar to B-Line B3373C.

2.4 HANGER RODS

- A. Electro-galvanized carbon steel similar to B-Line ATR.
- B. Select equipment hanger rods as required to properly support the equipment in-service load. Select tank, coil, etc. supports assuming that they are full of water when in service.

- C. Size equipment hanger rods as follows:

<u>Load/rod</u>	<u>Hanger Rod</u>
0 - 300 pounds	3/8 inch
301 - 600 pounds	1/2 inch
601 - 900 pounds	5/8 inch
901 - 1400 pounds	3/4 inch
1401- 1900 pounds	7/8 inch

- D. Size pipe hanger rods as follows:

<u>Pipe Size</u>	<u>Hanger Rod</u>
1/2 to 2 inches	3/8 inch
2-1/2 to 4 inches	1/2 inch
5 to 6 inches	5/8 inch
8 inches	3/4 inch
10 inches	7/8 inch

2.5 CHANNEL STRUTS

- A. Fabricated from 0.105 inch thick rolled mild steel. Unistrut, Erico Caddy, Power Strut, or equal. Select as follows for spans up to seven feet. For longer spans or greater loads submit Shop Drawing for review.

<u>Total Load</u>	<u>Unistrut</u>	<u>Power Strut</u>
0 - 245 pounds	P1000	PS 200
246 - 680 pounds	P1001	PS 200 2T3
681 - 1360 pounds	P1001C41	-----

- B. Finish: Zinc plated electrostatically for interior applications and hot dipped galvanized after fabrication for exterior applications.

2.6 ARTICULATING HANGER SYSTEMS

- A. Malleable iron eye socket fitting similar to B-Line B3222 .
- B. Carbon steel linked welded eye rod similar to B-Line B3211X .

2.7 STEEL WALL BRACKETS

- A. Carbon steel constructed so that hanger rod can be placed anywhere on horizontal member similar to B-Line B3066 for loads up to 1,000 pounds and similar to B-Line B3067 for loads up to 2,000 pounds.

2.8 CONCRETE INSERTS

- A. 12-gauge galvanized carbon steel with end caps, B-Line Continuous Concrete Insert B221 or similar, length selected as required to support load.

2.9 CONCRETE ANCHOR BOLTS

- A. Provide concrete anchor bolts rated for cracked concrete, acceptable for use in all Seismic Design Categories, tested and listed by third party suitable for the applicable seismic loads. For exterior applications provide anchors rated for exterior application such as stainless-steel anchors.
- B. Wedge anchors: Hilti Kwik Bolt TZ, Dewalt Power Stud+ SD2, Simpson Strong-Bolt 2 or equal.
- C. Drop-in or screw anchors: Powers Snake+, Simpson Titen HD, Hilti KH-EZ or equal.

2.10 ROLLER SUPPORTS AND PROTECTION SADDLES

- A. Pipe roller supports: Carbon steel with cast iron pipe roll. Pipe hanger rolls similar to B-Line B3110 . Pipe chair rolls similar to B-Line B3120 . Adjustable pipe chair rolls similar to B-Line B3122 .
- B. Protection saddles: Curved carbon steel plate similar to B-Line B3160-B3165 .

2.11 PIPE ALIGNMENT GUIDES

- A. Pipe guides for hot piping: Carbon steel. 4-inch minimum body length and 6-inch minimum spider length for 1-inch to 6-inch pipe sizes. 8-inch minimum body length and 8-inch minimum spider length for 8-inch and larger piping similar to B-Line B3281.

2.12 CHAIR ANCHORS

- A. Carbon steel chair and yolk bolts similar to B-Line B3147 .

2.13 SLIDE PLATE ASSEMBLIES

- A. Carbon steel support tee with stainless steel slide plate and carbon steel base with Teflon pad slide plate similar to B-Line B3891-B3897 or B3991-B3993, .

PART 3 EXECUTION

3.1 GENERAL

- A. Examine the Architectural and Structural Drawings and existing conditions and provide additional structural members or framing required to support the mechanical systems.
- B. Make no attachment for support of mechanical equipment, piping, or ductwork to the roof deck.
- C. Hanger spacing:

<u>Metallic Pipe Size (Inches)</u>	<u>Steel Pipe Maximum Spacing Between Supports (Feet)</u>	<u>Copper Tube Maximum Spacing Between Supports (Feet)</u>
1/2	7	5
3/4	7	5
1	7	6
1-1/4	7	7
1-1/2	9	8
2	10	8
2-1/2	11	9
3	12	10
4	14	12
5	16	
6	17	
8	19	
10	22	

- D. Where seismic restraints on piping and duct systems are not required as indicated in Section 20 05 48 "Seismic Controls for Mechanical," provide articulating hangers so that systems can swing freely.
- E. Provide additional support at pump bodies, valves, elbows, bends, and other locations where concentrated loads occur.

- F. Where groups of three or more pipes occur, they may be supported with trapeze hangers constructed from channel strut and hanger rods. Space trapeze hangers for smallest pipe supported.
- G. Do not support piping four inches size and larger from a single joist or structural member.
- H. Support hub and no-hub cast iron piping at each joint, in accordance with above hanger spacing table, or in accordance with coupling manufacturer's recommendations, whichever is more stringent.
- I. Support piping with sleeved couplings and grooved end piping at each length of pipe and at each fitting, in accordance with above hanger spacing table, or in accordance with coupling manufacturer's recommendations, whichever is more stringent.
- J. Provide floor mounted channel strut racks to support piping, ductwork, and equipment that cannot be otherwise supported from structure overhead or from walls.
- K. At piping penetrating wood framing, cut hole with hole saw and center piping in hole so that piping does not contact wood framing. Provide plastic isolation bushings at distances called for in "Hanger Spacing" table.
- L. Seal all penetrations of vapor retarder or membranes vapor tight.
- M. Adjust hangers and supports and place grout for concrete supports to bring support to proper elevations.
- N. When copper piping is placed in direct contact with channel strut supports, wrap piping at point of contact with two wraps of dielectric pipe wrap.
- O. Cut, drill, and punch metals cleanly and accurately. Remove burs and ease edges. Remove sharp or rough areas on exposed surfaces.

3.2 HANGERS ON INSULATED PIPING

- A. Place hanger or support in direct contact with the pipe unless specifically indicated that piping is to have continuous insulation. When placed in direct contact install fiberglass insulation around the hangers.
- B. For suspended piping required to have continuous insulation, provide calcium silicate insulation segments between supported piping and hangers / supports. In addition, provide galvanized iron shields between the insulation segments and hangers / supports. Fabricate shields for four inches and larger pipes of 16-gauge iron, 18 inches long. Shields for three inches and smaller pipes of 18-gauge material, 12 inches long. Match the radius of curvature of the shields with the outside radius of the insulation.

3.3 WALL MOUNTED PIPING

- A. Unless otherwise indicated, support piping that is installed exposed on walls with channel strut and compatible pipe clamps. Space supports in accordance with "Hanger Spacing" table.
- B. Support vertical piping drops within one foot of top of drop and within one foot of bottom of drop and in accordance with "Hanger Spacing" table.
- C. Where groups of two or more pipes occur support piping from common channel strut.
- D. Secure channel strut to poured concrete walls with expansion anchors, to CMU walls with expansion anchors in grouted cells, and to stud walls with screws into studs or blocking.
- E. Cut multiple channel strut supports for a piping run or drop to consistent lengths.

3.4 SEISMIC PROTECTION FOR MECHANICAL SYSTEMS

- A. Mechanical equipment shall be installed in accordance with ASCE 7 as referenced by IBC. Section 20 05 48 "Seismic Controls for Mechanical" summarizes the requirements of ASCE 7 for this Project.

3.5 CONCRETE STRUCTURES

- A. General:
 - 1. Anchoring into the bottom of concrete beams should be avoided. If required submit approach and method of detection and avoidance of bottom reinforcing steel for review by engineer.
 - 2. Provide flat washers under all nuts.
- B. Poured-in place:
 - 1. Install embedded items before concrete is placed.
 - 2. Fasten embedded items securely to prevent movement when concrete is placed.
 - 3. Secure Contracting Officer acceptance of embedded items prior to the placement of concrete.

- C. Concrete anchors bolts:
 - 1. Seismically rated anchors must be provided for each brace attachment to structure.
 - 2. Install in accordance with manufacturer's installation instructions including special inspection as required.
 - 3. Chemical anchors may not be used for equipment or equipment supports under tension.

- D. Through bolts:
 - 1. ASTM A307 bolts and nuts.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 20 05 48 - SEISMIC CONTROLS FOR MECHANICAL – DEFERRED DESIGN

- A. This Section covers calculations, installation, and materials used to seismically restrain mechanical systems and equipment.

1.2 SUBMITTALS

- A. Name and contact information of registered engineer providing seismic restraint design services.
- B. Manufacturer's Data:
1. Catalog cuts and selections of components for packaged seismic restraint systems and equipment.
- C. Seismic Restraint Schedule: Submit a schedule of restrain systems listing the application, product, material, and size proposed for each application.
- D. Test Reports and Certificates: Third party reports or certifications for concrete anchor bolts and where indicated.
- E. Submit plan with location of seismic restraints for distribution systems or submit letter verifying that seismic restrain locations will be field located under the supervision of registered engineer providing seismic restraint design services.
- F. Shop Drawings and calculations. Calculations for seismic restraints shall be in accordance with ASCE 7.
1. Each equipment anchorage submittal and each submittal for piping and ductwork supports not in accordance with referenced standards shall include the following data unless otherwise indicated:
 - a. Force calculations. Include equipment tag, equipment weight, center of gravity, seismic constants, and height within structure in calculations.
 - b. Catalog data indicating operating weight, dimensions, materials and construction details with anchors adequate to resist calculated forces.

G. Restraint Detail Index: Submit an index for equipment weighing over 20 pounds similar to the following example. Where equipment is rigidly mounted to the structure or plenum wall, such as cabinet unit heaters or propeller fans indicate as N/A. Where a detail provided as part of the Contract Documents is used, indicate detail reference. For each piece of equipment indicate anchor diameter, and embed depth where post installed concrete anchors are used.

H. Index Example:

Equipment Symbol	Equipment Type	Detail Tab or Reference	Anchor Diameter	Anchor Embed Depth
AHU-1	Air Handling Unit	2/M5 & 3/M5	1 /2 inch	4 inches
EF-1	Utility Fan	Tab 1	3/8 inch	N/A
RF-1	Propeller Fan	N/A	N/A	N/A
WH-1	Water Heater	6/M5	3/8 inch	N/A

1.3 SEISMIC DESIGN

- A. Project is designed in accordance with the adopted edition of IBC. Chapter 16 structural provisions references ASCE 7 which cover the design of the structural system and the installation of mechanical equipment within the structure. See IBC Reference Standards for the appropriate year for ASCE 7.
- B. Provide shop drawings signed by registered engineer in the State of Alaska for equipment, piping, and ductwork connections to building structure.
- C. Install mechanical equipment in accordance with ASCE 7. This section summarizes the requirements in Chapter 13 for this Project. The design constants for this Project include:
1. The Risk Category for this Project is II.
 2. The Seismic Design Category for this Project is D.
 3. Use value of SDS = 0.79 for seismic force calculations.
 4. All systems that are not related to life safety or for continued operation are $I_p=1.0$.

1.4 SYSTEMS NOT REQUIRING SEISMIC RESTRAINT

- A. Highly expanding systems: Refer to plan drawings for pipe anchor details and locations. Provided details and anchor sizing are designed to take into account both seismic forces and thermal expansion forces as part of an engineered system. Contractor is to provide additional thermal and seismic anchors and calculations for the below piping systems within the mechanical room. Additional anchors for thermal and seismic forces are not required or intended outside of the mechanical rooms.
1. Hydronic heating piping.
 2. Steam piping.
 3. Condensate piping.
- B. Equipment exempted from seismic restraint by ASCE 7: Chapter 13:
1. All equipment with an $I_p = 1.0$ weighing 400 pounds or less, mounted at four foot or less above floor level and flexible connectors between the components and associated ductwork, piping and conduit are provided.
 2. All equipment with an $I_p = 1.0$ weighing 20 pounds or less or, for distribution systems, weighing 5 pounds per foot or less and flexible connectors between the components and associated ductwork, piping and conduit are provided.
- C. Piping exempted from seismic restraint by ASCE 7: Chapter 13:
1. All mechanical components with an $I_p = 1.0$ weighing less than 20 pounds with flexible connectors between the components and associated piping are provided.
 2. Non-ductile piping systems with $I_p = 1.0$ weighing 5 pounds/foot or less (includes filled water weight):
 - a. 2-inch or less diameter cast iron piping.
 3. High-deformability piping (Steel and Copper) is used with an $I_p = 1.0$; provisions are made to avoid impact with larger piping or mechanical components or to protect the piping in the event of such impact:
 - a. Nominal pipe size shall be 3-inch diameter or less.

1.5 EQUIPMENT SEISMIC RESTRAINT

- A. Equipment shall be supported and attached to withstand seismic forces. Shop Drawings and calculation details for anchorage of equipment shall be submitted in accordance with this section. Shop drawings for restraint within or upon equipment base may be provided by a specialty equipment consultant or equipment manufacturer.

B. Special Certification Requirements for Designated Seismic Systems:

1. In accordance with ASCE 7 section 13.2.2 Certifications shall be provided for designated seismic systems assigned to Seismic Design Categories C through F or system is assigned an $I_p = 1.5$.

1.6 PIPING AND DUCTWORK SEISMIC RESTRAINT

A. General:

1. Verify that the hanger support system and its attachment to the structure are adequate for the gravity load plus the vertical seismic force equal to the maximum horizontal seismic force.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

- A. Obtain, pay for, and coordinate special inspection of anchor bolts used for seismic restraint.
- B. Submit results of special inspection, indicating date, and anchors inspected, prior to calling for Substantial Completion and final inspections.
- C. Examine the Architectural Drawings and existing conditions and provide additional structural members or framing required to support the mechanical systems.
- D. Make no attachment for support of mechanical equipment, piping, or ductwork to any roof deck with an Inverted Roof Membrane Assembly.
- E. Seal all penetrations of vapor retarder or membranes vapor tight.
- F. Install anchor bolts in accordance with manufacturers' instructions and third-party evaluation report including special inspection as required.
- G. Friction clips shall not be used for anchorage.
- H. Power driven fasteners shall not be used in tension load applications.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 20 05 53 - IDENTIFICATION FOR MECHANICAL

- A. This Section covers the identification of mechanical systems and components.

1.2 SUBMITTALS

- A. Manufacturer's Data:
 - 1. Catalog Cuts and selections for identification products and accessory items.
- B. Valve Tag Schedule: Submit a schedule of valve tags listing the valve number, service, location, and valve size for each tagged valve.

PART 2 PRODUCTS

2.1 PIPE MARKERS

- A. Pressure-sensitive identification markers banded in place with color-coded tape incorporating direction of flow arrows similar to "Opti-Code" markers and "Arrows On a Roll," Seton Name Plate Corp., Brady, Brimar, or equal. Painted stencil markers are not acceptable.

- B. Provide markers of length and with letter size indicated below. Diameter listed is outer diameter of insulation if piping is insulated.

Nominal <u>Diameter</u>	Marker <u>Length</u>	Letter <u>Height</u>
3/4 to 1-1/4 inch	8 inches	1/2 inch
1-1/2 to 2 inches	8 inches	3/4 inch
2-1/2 to 7 inches	12 inches	1-1/4 inch

- C. Provide marker with appropriately color-coded background and with a clearly printed legend to identify the contents of the pipe in conformance with the "Scheme for the Identification of Piping Systems" (ANSI A13.1).

2.2 PIPE MARKERS

A. Removable and reusable, color-coded, vinyl identification markers and direction of flow arrows on plastic base, held in place with color-coded, plastic-coated wire. Brady Snap-On, Seton, Brimar or preapproved equal.

B. Provide markers of length and with letter size indicated below. Diameter listed is outer diameter of insulation if piping is insulated.

<u>Nominal Diameter</u>	<u>Base Length</u>	<u>Base Height</u>
3/4 inch or less	4.5 inches	1 inch
1 to 2-1/2 inches	11 inches	1-1/2 inches
3 inches or greater	18 inches	2-1/2 inches

C. Provide marker with appropriately color-coded background and with a clearly printed legend to identify the contents of the pipe in conformance with the "Scheme for the Identification of Piping Systems" (ANSI A13.1).

2.3 VALVE TAGS AND COLD PIPING ACCESSORY TAGS

A. Laminated plastic with subsurface printing, heavy duty, brass bead chain, and appropriately colored border. Craftmark, Seton, Brimar, or equal.

B. Minimum of 2-inch diameter round tag or 2-inch square tag with maximum three text lines, 0.2-inch high characters, 8 characters per line.

C. On each tag, print valve number and message describing system, function, and equipment and/or area/room served. Message shall be as complete as possible within space available.

D. Number valves sequentially.

2.4 EQUIPMENT LABELS

A. Minimum 1-inch high by 1/16-inch thick, black, laminated plastic with white core. "Setonply" by Seton Nameplate Corp., Craftmark, Brimar, or equal.

B. Engraved with 3/8-inch high characters identifying the item or equipment by symbol and description indicated on the Drawings.

2.5 ACCESS PANEL AND CEILING IDENTIFICATION MARKERS

- A. Color coded dots. Seton, Avery, Craftmark or equal.
- B. Color coded tacks. Seton, Avery, Craftmark or equal.
- C. Color code markers as follows:
 - 1. Fire dampers and fire protection valves: Red.
 - 2. Dampers and ventilation devices: Blue.
 - 3. Plumbing valves and devices: Green.
 - 4. Heating valves: Yellow.

2.6 BURIED UTILITY LINE MARKERS

- A. Six inches wide, bright color facing, labeled as appropriate for utility marked. Seton Nameplate Corp. Brimar, Emedco or equal.
- B. Provide six inches wide metalized foil core markers for non-metallic buried utilities. Seton Nameplate Corp Detection Tape, Brimar, Emedco, or equal.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION

- A. Identify new piping, valves, balancing cocks, ducts, and equipment in the facility whether concealed within accessible spaces or exposed.
- B. Do not label piping or ductwork exposed to view in offices or in public access areas.
- C. Identify insulated and uninsulated piping and ductwork.
- D. Locate identification so that it is readable by a person standing on the floor for exposed items or at point of access for concealed items.

3.2 PIPING AND DUCTS

- A. Provide identification at both sides of partitions and floors, at all branch takeoffs, at connections to equipment and at intermediate intervals not in excess of fifty feet.
- B. Secure pipe pressure-sensitive vinyl markers in place with pressure-sensitive tape incorporating direction of flow arrows on both ends of label. At each end make two complete wraps around the pipe with tape so that tape is wrapped back on itself to assure attachment.

3.3 BURIED UTILITY LINE MARKERS

- A. Install full length of utility at a depth of two feet above utility line.

3.4 VALVES

- A. Identify normally open valves and balancing cocks with valve identification tags. Unless otherwise noted, equipment isolation valves and balancing cocks that are located adjacent to equipment isolated are exempted from this requirement.
- B. Identify equipment isolation valves located in ceiling plenums and raised floor plenums unless the equipment isolated is also located in the ceiling plenum or raised floor plenum and is adjacent to isolation valve.
- C. Identify normally closed valves with valve identification tags and with a second valve tag reading "NORMALLY CLOSED" in 1/2-inch-high letters.
- D. Permanently mark, etched or stamped, balancing cock setpoint readings on one and one-half inches diameter brass valve tags attached to balancing cocks with No. 6 bead chain.

3.5 EQUIPMENT

- A. Identify equipment, i.e. fans, pumps, coils, tanks, control panels, etc., with equipment labels mounted in readily accessible and readable location.
- B. Mechanically secure labels with a minimum of two screws, bolts, or rivets. Adhesive backing does not provide secure mounting.

3.6 ACCESS PANEL AND CEILING IDENTIFICATION MARKERS

- A. Provide identification markers for accessible tile ceiling areas and on access panels to indicate the location of balancing cocks, valves, volume dampers, fire dampers and other concealed mechanical items that may require service or adjustment.
- B. Apply markers to the exposed face of panel or the ceiling tee bar nearest the concealed item.
- C. Familiarize the Owner's maintenance personnel with the location and function of the markers during the instruction period.

3.7 PIPING AND VALVE TAG LABELS

- A. Label piping in accordance with ASME A13.1 requirements as specified by the following schedule.

<u>SERVICE</u>	<u>MARKER LABEL</u>	<u>LABEL/LETTER COLOR</u>	<u>BAND COLOR</u>
Gas:			
Natural Gas	Natural Gas	Yellow/Black	
Propane Gas	Propane Gas	Yellow/Black	
Engine Exhaust	Exhaust	Brown/White	White
L.P. Steam (<30#)	Steam	Green/White	Red
L.P. Condensate (<30#)	Condensate	Green/White	Red
M.P./H.P. Steam (>30#)	Hi-Pressure Steam	Green/White	Red
M.P./H.P. Condensate (>30#)	Hi-Pressure Condensate	Green/White	Red
Condensate Tank Vent	Vent	Green/White	White
Other:			
Glycol Heating Water Supply	Glycol Htg. Supply	Green/White	Gold
Glycol Heating Water Return	Glycol Htg. Return	Green/White	Gold

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 20 07 00 - INSULATION FOR MECHANICAL

- A. This Section covers selection and installation of insulation used in the mechanical systems.

1.2 SUBMITTALS

- A. Manufacturer's Data:
 - 1. Catalog cuts and selections of insulation products and accessory items.
- B. Application Schedule: Submit a schedule of insulation types listing the application, product, material, and thickness proposed for each application.

PART 2 PRODUCTS

2.1 GENERAL

- A. Provide interior insulation having UL listed composite fire and smoke hazard rating not exceeding:
 - 1. Flame Spread: 25.
 - 2. Smoke Developed: 50.
- B. Provide accessories such as adhesives, mastics, cement, tapes, and jackets having the same component rating as listed above.
- C. Lagging fabric: 100 percent textured silica yarn or 100 percent cotton fabric, eight ounce per square yard, with or without pre-applied rewettable adhesive finish. Fattal's Thermocanvas, Zetex 300, Newtex, or equal.
- D. Thermal Insulation Coatings: Washable, abrasion resistant coating for thermal insulation. Minimum continuous service rating of 180 degrees F. Maximum dry basis VOC level of 80 grams per liter. Used to adhere lagging fabric without pre-applied rewettable adhesive finish to pipe and duct insulation. Foster #30-36 Sealfas, MEI, Fiberlock, or equal.
- E. Insulating cements: Mineral fiber base with maximum 0.90 (BTU-inch)/(square foot-hour-Fahrenheit) conductivity at 200 degrees F mean temperature.
- F. Vapor barrier coatings: Water based, fire resistive, flexible, maximum 0.08 perm water vapor permeability. Foster #30-80, MEI, Fiberlock, or equal.

- G. Preformed plastic insulation covers and inserts: PVC with fiberglass inserts provided by cover manufacturer. Johns-Manville Zeston, Fuller Speedline, Proto, or equal.
- H. Metal Jackets: 0.024-inch-thick embossed aluminum jacket meeting ASTM B209 with 1/2-inch wide, 0.015 inch thick, annealed stainless steel bands.

2.2 INTERIOR, ABOVE GRADE, PIPING SYSTEM INSULATION

- A. Fiberglass preformed by the manufacturer specifically for the size pipe or tubing on which it is to be installed unless otherwise indicated. Owens/Corning Fiberglass 25 ASJ, Johns-Manville Micro-Lok 650 with AP-T self-sealing jacket, Knauf ASJ, or equal.
- B. Continuous service rating: 500 degrees F minimum.
- C. Provide with vapor barrier jacket with maximum water vapor permeability of 0.02 perm and minimum beach puncture resistance rating of 50 units and a white kraft paper facing.
- D. Conductivity: 0.28 (BTU-inch)/(square foot-hour-Fahrenheit) maximum at 100 degrees F mean temperature.

PART 3 EXECUTION

3.1 GENERAL

- A. Provide insulation for new piping for the systems indicated below unless otherwise indicated.
- B. Replace existing insulation that is removed to accomplish Work with new insulation as specified in Part 2 of this Section or to match existing if not specified. Match existing thickness unless otherwise indicated.
- C. Surface Preparation: Prior to insulation installation, clean and dry exterior surfaces of pipe and ductwork.
- D. Patch insulation on existing pipe and ductwork mains at removed branches. Match existing insulation and finish.
- E. Do not cover or obscure manufacturer or field applied identification tags, nameplates, information labels, etc.
- F. Seal exposed ends and face of cuts in fiberglass insulation with thermal insulation coating.

- G. At and within 6 feet of finished floor in mechanical rooms, ventilation rooms, janitor’s closets and high abuse areas, provide aluminum jacket over outer layer of exterior insulation, joined with longitudinal slip joints with minimum 2-inch lap, and with seams and joints sealed to provide water tight jacket. Secure jacket with stainless steel bands at 9-inch centers. At fitting or other locations where bands cannot be used secure jacket with galvanized zinc plated screws at 4-inch centers along seams.

3.2 INTERIOR, ABOVE GRADE PIPING SYSTEMS INSULATION, GENERAL

- A. Unless otherwise indicated insulate the following piping systems with insulation thickness, additional insulation covering and insulation with a continuous vapor barrier in accordance with ASHRAE 90.1. Details used by this standard are included in the following schedule:

- 1. Hot Water heating systems with design operating temperatures from 141 degrees F to 200 degrees F hot piping:

<u>Pipe Size</u>	<u>Insulation Thickness</u>	<u>Lagging Fabric Required</u>	<u>Continuous Vapor Barrier Required</u>
<2 inches	1-1/2 inch	{1}	No
2 inches and larger	2 inches	{1}	No

- {1} Lagging required at exposed installations, including mechanical spaces
- {2} Provide continuous insulation.
- {3} Insulation thickness may be reduced to 1” on branch piping serving a single terminal unit.

- 2. Low pressure steam heating system with design operating temperatures from 201 degrees F to 250 degrees F hot piping:

<u>Pipe Size</u>	<u>Insulation Thickness</u>	<u>Lagging Fabric Required</u>	<u>Continuous Vapor Barrier Required</u>
<4 inches	2-1/2” inches	{1}	No
4 inches and larger	3 inches	{1}	No

- {1} Lagging required at exposed installations, including mechanical spaces
- {2} Provide continuous insulation.

- B. Where pipes are insulated with two layers, stagger the insulation joints.
- C. Where insulation terminates, continue insulation jacketing to cover exposed insulating material and seal to adjoining pipe with vapor barrier coating for cold piping and thermal insulation coating for hot piping.

- D. Insulate equipment and accessories with the same thickness as is called for on adjoining piping unless otherwise indicated.
- E. Insulate pipe fittings to the same thickness as adjoining pipe insulation. Insulate fittings with preformed plastic insulation covers packed full with fitting manufacturer provided fiberglass insulation or with segmented sections of pipe insulation and 1/4-inch coat of insulating cement.
- F. Insulate solder and threaded end gate, globe, and ball valve bodies with pipe insulation. Do not insulate valve bonnets or bonnet rings. Fill voids between cutouts and valve body with insulating cement.
- G. Insulate flanged end gate and globe valve bodies with insulating cement. Do not insulate valve bonnets.
- H. Insulate thermometer wells with pipe insulation. Terminate insulation at the socket.
- I. Insulate air separators and heat exchangers same as pipe.
- J. Place hanger or support in direct contact with the pipe and install fiberglass insulation around the hangers when continuous insulation is not required.
- K. To provide continuous insulation on piping systems, place support or hanger around piping insulation, provide calcium silicate insulation segments between the pipes supported and the support. In addition, provide galvanized iron shields between the insulation segments and the supports, see Specification 20 05 29 "Hangers and Supports for Mechanical".

3.3 INTERIOR, ABOVE GRADE PIPING SYSTEMS INSULATION, HOT PIPING

- A. Insulate heating water (glycol) supply and return piping. Insulation is not required on concealed branch line piping serving finned tube radiation.
- B. Terminate insulation at wall and floor penetrations. Maintain minimum one-inch clearance to combustible construction. At exposed locations, size penetration so that butting insulation to wall trims out penetration.
- C. Seal and secure seams and joints to provide a neat and evenly rounded finished surface. It is not necessary to seal penetrations if holes are neatly cut in the insulation and there is a tight fit between the insulation and the penetrating equipment. A complete vapor barrier envelope is not required.
- D. At exposed installations, including mechanical spaces, cover piping insulation and ends with lagging fabric, which has been dipped in a thermal insulation coating. Lap lagging fabric over ends of preformed plastic insulation covers. In office areas and in areas exposed to public view, install lagging fabric neatly, with cut rather than torn edges, to give a clean architectural appearance.

- E. Secure self-sealing lap on concealed piping insulation with outward clinching staples at a maximum spacing of one foot on center.
- F. Insulation is not required on flexible connectors, check valves, pipe guides, anchors, strainers, traps, meters, and pump bodies and any section of pipe between them less than 6 inches in length.
- G. When pipe insulation is installed around ring, clamp, and clevis type hangers place the seam at the hanger rod and slit the sealing lap to pass around the rod.
- H. Notch pipe insulation at trapeze hangers and at angle iron floor and wall supports. Seal insulation exposed to atmosphere with a thermal insulation coating.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 05 00 - COMMON WORK RESULTS FOR HVAC

- A. This Section covers selection and installation of basic pipe materials and specialties.

1.2 SUBMITTALS

- A. Manufacturer's Data:

1. Catalog Cuts and selections for equipment and accessory items.

- B. Balancing Cock Schedule: Submit a schedule of balancing valves listing the service, location, valve size, and flow setting (GPM) for each balancing valve.

- C. Substantial deviations:

1. Submit to the Contracting Officer Shop Drawings of any proposed substantial deviations in the piping systems for this facility from these documents for review and acceptance.
2. Any substantial deviations from these documents installed prior to Contracting Officer review and acceptance of submittal may be required by the Contracting Officer to be removed and the indicated system be installed at no additional cost to the Owner.
3. The Contracting Officer is the sole judge of what constitutes a substantial deviation and what is an acceptable alternate technique or method.

PART 2 PRODUCTS

2.1 GENERAL

- A. Provide all pipes, fittings, and accessories required for complete functioning installation of all piping systems specified and required under this Division.
- B. Miscellaneous items specified and required under this Division are not necessarily indicated on the Drawings.

2.2 THERMOMETERS

- A. Solar or light powered 1/2-inch LCD digital display, -40 to 300 degrees F range, adjustable position face. Weiss, Miljoco, Trerice, or equal.
- B. Pipe mounted with brass separable socket.
- C. Duct mounted provide 9-inch stem and duct mounting flange.
- D. Provide insulation extensions as required.

2.3 PRESSURE GAUGES

- A. 4-1/2-inch diameter dial, bourdon tube type. Trerice, Weiss, Miljoco, or equal.
- B. Phosphor-bronze bourdon tube.
- C. Movement: Brass rotary type with bronze bushings.
- D. Case: Cast aluminum, style to suit application.
- E. Provide combination pressure/vacuum gauges where gauges are called for, at suction side of pumps.
- F. Select range so normal operating pressure falls near mid-range.
- G. Provide impulse dampeners where gauges are called for at the suction and discharge side of pumps and similar locations.
- H. Provide insulation extensions as required.
- I. Provide with brass siphon, 250 psig rated, on steam service.

2.4 STEAM PRESSURE GAUGES

- A. 4-1/2-inch diameter dial, bourdon tube type. Trerice, Weiss, Miljoco, or equal.
- B. Stainless steel bourdon tube with stainless steel socket and tip.
- C. Provide with steel siphon, 300 psig rated.
- D. Movement: Brass rotary type with bronze bushings.
- E. Case: Cast aluminum, style to suit application.
- F. Select range so normal operating pressure falls near mid-range.
- G. Provide insulation extensions as required.

2.5 PRESSURE AND TEMPERATURE TEST PORTS

- A. Solid brass plug with Nordel or EPDM core rated for zero leakage to 500 psig and 275 degrees F. Sisco P/T Plugs, Pete's Plug, Caleffi, or equal.
- B. Provide insulation extensions as required.
- C. Unless otherwise indicated, provide 3/4-inch ball valve or 1/2-inch ball valve if line size is less than 3/4-inch. Provide with brass hose end fitting and cap.

2.6 BALANCING COCKS

- A. Balancing cock with check valved pressure sensing taps, drain tap, and memory stop. B & G Circuit Setter Plus, Armstrong CBV, Taco Accu-Flow, TA Hydraulics, or equal.
- B. Teflon seats, EPT checks, EPDM stem "O" ring.
- C. 200 psig, 250 degrees F rated.

2.7 FLEXIBLE CONNECTORS

- A. Corrugated hose and single braid fabricated from carbon steel for iron or steel systems. Flexonics Series 100, Metraflex, Twin City Hose, or equal.
- B. Corrugated hose and single braid fabricated from bronze for copper systems. Flexonics Series 200, Metraflex, Twin City, or equal.
- C. Rated for 200 psig at 200 degrees F.
- D. End fittings to suit installation.
- E. Minimum live length is manufacturer's recommended length to allow 3/8-inch minimum offset distance from centerline.

2.8 AIR VENTS

- A. Automatic air vents: Non-ferrous, rated for 150 psig operating pressure at 240 degrees F. Spirotherm Spirotop VTP-38, Taco Hy Vent No 426, Bell and Gossett No. 87, or equal.
- B. High capacity automatic air vents: Iron body and bonnet with stainless steel, brass, and EPDM internal components, rated for 150 psig at 240 degrees F. Bell and Gossett No. 107A, Sarco, or equal.
- C. Manual air vents: "Coin-operated" air vent. B & G No. 4V or equal.

2.9 STRAINERS

- A. Steel or iron systems: Steel or cast iron body with 304 stainless steel screen, off-center blow down, gasketed cap. Sarco 34/CI-125/AF-250, Nibco F-721-A, Armstrong, or equal.
- B. High pressure steam systems: Steel bodies. Bronze, brass, or copper parts and appurtenances shall not be provided. Watts, Bell and Gossett, or equal.
- C. Copper systems: Bronze body and cap with 304 stainless steel screen. Sarco BT/TBT, Nibco S/T-221, Armstrong, or equal.
- D. Stainless steel systems: All 316 stainless steel construction. Gasketed cap. Pressure rating to match system. Sarco 16/36/CSS or equal.
- E. Pressure rating to match system rating.
- F. Unless otherwise indicated provide with the following screen sizes:
 - 1. Fire protection systems: 1/4-inch perforations.
 - 2. Steam and hydronic systems:
 - 3. Three inches and smaller: 20 mesh.
 - 4. Four inches and larger: 1/8-inch perforations.

2.10 MECHANICAL PIPE SEALS

- A. Watertight, modular mechanical type, consisting of interlocking links shaped to continuously fill the annular space between the pipe and wall opening. Thunderline Link-Seal, Metraflex, Flexicraft, or equal.
- B. Loosely assembled links with carbon steel, galvanized plated bolts and nuts forming a continuous rubber belt around the pipe with a glass reinforced, nylon plastic pressure plate under each bolt head and nut.
- C. Provide seal elements constructed from materials recommended by the manufacturer for the installed application.
- D. Primer coated steel wall sleeve with continuously welded water stop plate of same manufacturer as links to assure proper size selection. Thunderline Link-Seal Model WS, Metraflex, Flexicraft, or equal.

2.11 DIELECTRIC PIPE PROTECTION

- A. Polyvinyl, 20 millimeter, self-adhesive. Westape, Calpico, 3M, or equal.
- B. Dielectric nipples and flanges only. Dielectric unions are specifically not allowed.

2.12 ESCUTCHEONS

- A. Chrome plated brass or stainless steel, spring clip. Dearborne Brass Series 5300, Brasscraft, Viking, or equal.

2.13 FLOW TEST KIT

- A. At time of instruction of Owner personnel, provide a test kit of same manufacturer as balancing cocks or flow control valve provided with carrying case containing two each 2-1/2 inches dial face pressure gauges, with recalibratator, range 0 - 60 psig; two each gauge adapters; and two each one-inch dial face, five inches stem thermometers, 0 to 220 degrees F.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION AND APPEARANCE

- A. Conceal piping above ceilings or in walls unless otherwise noted. Expose piping in spaces without ceiling or furred-in enclosures.
- B. Install piping in truss space in areas with exposed trusses unless otherwise noted.
- C. Route piping within the facility vapor retarder and insulation boundary.
- D. Ream pipes thoroughly and clean before installation.
- E. Flush lines clear of debris, scale and discoloration prior to startup. Clean out all strainers and drip pockets after flushing.
- F. Run pipes with proper grade to provide for easy drainage and venting.
- G. Support piping to provide an installation that is without sag or droops.
- H. Provide pipe supports and offsets, loops or accessories at equipment connections to minimize connection stress caused by normal system warm-up, cool-down and equipment operation.
- I. Install parallel runs of non-insulated piping as required to provide a minimum of six-inch clearance between piping.

- J. Install parallel runs of insulated piping as required to provide a minimum of four-inch clearance between insulation surfaces.
- K. Install piping and equipment as required to provide minimum 6 feet 8 inches of headroom in mechanical rooms, piping within 12 inches of the ceiling in other spaces with exposed piping, and as required to not interfere with other items or access to equipment.
- L. At piping penetrating wood or metal framing, cut hole with hole saw and center piping in hole so that piping does not contact wood framing. Provide plastic isolation bushings as required to adequately support piping.
- M. Provide escutcheons around pipes at finished floor, ceiling or wall penetrations. Slip steel escutcheons onto piping prior to joining pipe. Set steel escutcheons with bead of paintable silicon sealant at perimeter, press tight to wall or floor, and remove excess sealant.

3.2 FITTINGS, VALVES, AND ACCESSORIES

- A. Make changes of direction, branches, and reductions in pipe size with fittings. Bushings are allowed only in non-pressurized tanks and similar equipment.
- B. Provide isolation valves at pressure gauges.
- C. At pressure reducing valves, control valves, and other devices whose size is less than adjoining pipe size, provide reducers immediately adjacent to the device.
- D. Provide isolation valves in piping adjacent to equipment, including terminal units, and where indicated. Locate valves on system side of unions or flanges.
- E. Provide unions or flanges at connections to equipment and control valves to allow maintenance. Locate unions or flanges to allow maintenance without removal of any additional piping other than that between the union or flange and the equipment. Use of dielectric unions is prohibited.
- F. Provide drains valves at all low points in piping systems for drainage unless otherwise indicated.
 - 1. Drains are not required at plumbing fixtures if stop valve forms the low point of the branch.
 - 2. Drains are not required where screwed cap dirt legs are indicated.
 - 3. Provide threaded plug where space is not available to install a drain valve.
- G. Provide metal-to-metal seated globe valves at strainer blow down connections. Valve size to match blow down connection size.

- H. Provide air vents at high points in closed loop or recirculating piping systems. Install automatic air vents, with isolation valve, throughout the piping systems except where specifically indicated otherwise. Provide manual air vents, with valve, where air vents are required under finned tube radiation enclosures or where space will not allow installation of automatic air vent with isolation valve. Keep automatic air vent isolation valves closed except when purging air from system. Close isolation valves at end of Project.
- I. Install balancing cocks with test ports at or above the horizontal position. Permanently mark, etched or stamped, balancing cock setpoint scale readings and balanced flow in GPM on 1-1/2 inches diameter brass valve tags attached to balancing cock with No. 6 bead chain. This tag is in addition to valve identification tag called for elsewhere.
- J. Install flow control valves with test ports at or above the horizontal position.
- K. Provide flexible connectors where indicated and on all connections to vibration isolated equipment.
- L. Provide mechanical pipe seals where indicated. Provide steel wall sleeves at wall penetrations where mechanical pipe seals are installed except penetrations of existing poured concrete walls which may be core drilled to manufacturers recommended diameter.
- M. Provide pressure and temperature test ports where indicated and at the following locations:
 - 1. At inlets to and outlets from hydronic system equipment and terminal units except finned tube radiation, reheat coils, unit heaters, and cabinet unit heaters.
- N. Install thermometers, gauges, and plugs above the horizontal axis on horizontal pipe and orientated such that they are easily readable by a person standing on the floor for exposed equipment or from point of access for concealed equipment. Provide insulation extensions where thermometers, gauges, and plugs are installed on insulated piping.
- O. At 1-1/2 inches and smaller piping, install thermometers in pipe tees one size larger than line size.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 05 23 - GENERAL DUTY VALVES FOR HVAC

- A. This Section covers the selection and installation of manual valves.

1.2 SUBMITTALS

- A. Manufacturer's Data:
1. Catalog Cuts and selections for valves and accessory items.
- B. Application Schedule: Submit a schedule of valves listing the application, product, material, and size proposed for each application.

PART 2 PRODUCTS

2.1 GENERAL

- A. Standardize on one make as much as possible but not to the extent of sacrificing quality listed. Apollo, Grinnell, Jomar, Milwaukee, Nibco, Stockham, Vogt, or equal.
- B. Provide ball valves where indicate, in lieu of gate valves for heating systems in piping three-inch and less in size. All valves, three inches and smaller, shall be of same type. Provide ball valves installed in insulated piping systems with extended stems to bring the handle clear of the insulation.
- C. ASME Class 125 unless otherwise indicated.
- D. Gate and globe valves: Repackable under pressure with valve fully open.

2.2 HYDRONIC AND LOW PRESSURE STEAM SYSTEM VALVES

- A. Valves 3 inches and smaller:
1. Isolation Valves:
 - a. Ball valves for hydronic service: Full port, two-piece, brass body with brass internals, chrome plated or stainless steel ball, reinforced Teflon seats and seals, non-blowout stem similar to Nibco S-FP-600A/T-FP-600A.

- b. Gate valves for steam service: Rising stem, union bonnet, solid wedge disc. Bronze body, bonnet, stem, and disc. Malleable iron hand wheel. Teflon or graphite impregnated fiber packing similar to Nibco T-134.
 - c. Automatic air vent, pressure gauge, pressure test port isolation valves, and finned tube element drain valves: Bronze body ball valve, Teflon seats, vitron O-ring stem seals, chrome plated brass ball, non-blow out stem. For finned tube element drains, provide with screw slot instead of handle similar to Jomar T-82 Mini.
2. Globe valves: Rising stem, union bonnet, renewable seat and disc. Bronze body, bonnet, stem, and disc holder. Teflon disc. Malleable iron hand wheel. Teflon or graphite impregnated fiber packing similar to Nibco S-235-Y/T-235-Y.
 3. Check valves installed in horizontal lines and vertical lines with upward flow: Bronze body and cap, renewable seat and disc, teflon disc. Swing check, Y-Pattern, with threaded cap that allows for removal of entire disc assembly through top of valve body similar to Nibco S-413-Y/T-413-Y.
- B. Valves 4 inches and larger:
1. Iron body, bronze mounted (IBBM).
 2. Flanged ends.
 3. Isolation valves: Rising stem, OS and Y, bolted bonnet, solid wedge disc, gate valve. Teflon or graphite impregnated fiber packing similar to Nibco F617-0.
 4. Globe valves: Rising stem, OS and Y, bolted bonnet, renewable seat and disc. Teflon or graphite impregnated fiber packing similar to Nibco F-718-B.
 5. Check valves installed in horizontal lines and vertical lines with upward flow: Renewable seat and disc, bronze disc. Swing check design with bolted cap that allows for removal of entire disc assembly through top of valve body similar to Nibco F918-B/T918-B.
 6. Check valves indicated to be "non-slam": Center guided disc. Cast iron body, bronze seat and disc, stainless steel spring and set screws. One psig maximum pressure drop at 6 FPS flow velocity similar to Nibco F-910.

2.3 LOW PRESSURE STEAM, CONDENSATE AND VENT VALVES

A. Valves 2 inches and smaller:

1. Gate valves for steam service: Rising stem, union bonnet, solid wedge disc. Bronze body, bonnet, stem, and disc. Malleable iron hand wheel. Teflon or graphite impregnated fiber packing similar to Nibco T-134.

B. Valves larger than 2 inches:

1. Isolation valves: Flanged ends. Class 125. OS and Y, bolted bonnet, solid wedge iron disc, gate valve. Iron body and all iron trim. Teflon or graphite impregnated fiber packing similar to Nibco F-617-ON.
2. Globe valves: Flanged ends. Class 125. OS and Y, bolted bonnet, renewable seat and disc, iron disc. Iron body and all iron trim. Teflon or graphite impregnated fiber packing similar to Nibco F-718-N.
3. Check valves installed in horizontal lines and vertical lines with upward flow: Flanged ends. Class 125. Renewable seat and disc, iron disc. Bolted bonnet. Iron body and all iron trim. Swing check design with bolted cap that allows for removal of entire disc assembly through top of valve body similar to Nibco F-918-.

2.4 HIGH PRESSURE STEAM VALVES

A. Valves 3 inches and smaller:

1. ASME Class 150.
2. Isolation valves: Rising stem, union bonnet, solid wedge disc. Bronze body, bonnet, stem, and disc. Malleable iron hand wheel. Teflon or graphite impregnated fiber packing similar to Nibco T-134 or equal.
3. Globe valves: Rising stem, union bonnet, renewable seat and disc. Bronze body, bonnet, stem, and disc holder. Malleable iron hand wheel. Teflon or graphite impregnated fiber packing similar to Nibco T-235-Y or equal.
4. Check valves installed in horizontal lines and vertical lines with upward flow: Bronze body and cap, renewable seat and disc, Teflon disc. Swing check, Y-Pattern, with threaded cap that allows for removal of entire disc assembly through top of valve body similar to Nibco T-433-Y.

B. Valves four inches and larger:

1. ASME Class 200.
2. Isolation valves: Rising stem, union bonnet, solid wedge disc. Bronze body, bonnet, stem, and disc. Malleable iron hand wheel. Teflon or graphite impregnated fiber packing similar to Nibco T-154-A.

3. Globe valves: Rising stem, union bonnet, renewable seat and disc. Bronze body, bonnet, stem, and disc holder. Malleable iron hand wheel. Teflon or graphite impregnated fiber packing similar to Nibco T-256-AP.
4. Check valves installed in horizontal lines and vertical lines with upward flow: Bronze body and cap, renewable seat and disc, bronze disc. Swing check, Y-Pattern, with threaded cap that allows for removal of entire disc assembly through top of valve body similar to Nibco T-453-B.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Provide isolation valves in piping adjacent to equipment, including terminal units, and where indicated. Locate valves on system side of unions or flanges.
- B. Provide high-pressure steam valves on upstream side of building steam pressure reducing station and in all systems not served by the steam pressure reducing station.
- C. Do not install valve stems below horizontal.
- D. Install globe valves in heating and fuel oil systems such that valve closes against normal fluid flow.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

- A. This Section covers balancing and adjusting of mechanical systems.

1.2 SUBMITTALS

- A. Balancer Qualifications and Balancing Plan:

1. Name and address of balancing subcontractor.
2. Balancing subcontractor's certificates, qualifications, and experience in balancing mechanical systems, located in Alaska, of comparable type and size to those associated with this Project.
3. Copies of standard data report forms proposed for use on this Project.
4. Project specific plan/procedures for balancing of mechanical systems.

- B. Test and Balancing Report

1.3 QUALITY ASSURANCE

- A. The balancing subcontractor shall be a firm, independent of the General Contractor or any other subcontractor, specializing in balancing mechanical systems, with at least five years' experience in balancing mechanical systems, located in Alaska, of comparable type and size to those associated with this Project.
- B. Comply with the applicable procedures and standards outlined in one of the following publications:
1. "National Standards for Total Systems Balance" 2002 by the Associated Air Balance Council.
 2. "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems," dated January 2005, by the National Environmental Balancing Bureau.
- C. Instruments used in the balancing procedure must have been calibrated within a period of 12 months, or as otherwise recommended by the equipment manufacturer, and checked for accuracy prior to start of Work. Make maintenance and calibration records for all equipment available on request for examination by the Contracting Officer.

PART 2 PRODUCTS

2.1 BALANCING REPORTS

- A. Bind, tab by system, number pages, and include a table of contents at the beginning of the report.
- B. Label the front cover and end panel. Label to include Project title, Project number, date, and facility name.
- C. Include a cover sheet containing the following information:
 - 1. Project title, Project number, facility name, Contractor, and date.
 - 2. Name and address of balancing agency performing Work.
 - 3. Signature and seal of responsible member of balancing agency.
- D. Provide list of balancing equipment used on this Project with date of last calibration indicated.
- E. Summarize Work observed that does not conform to the Contract Documents and Work that does not allow the system to be balanced in accordance with the Contract Documents. Include opinions on why Work does not allow the system to be so balanced, collect data to support those opinions, and recommendations for corrective action that would allow the system to be so balanced.
- F. Compile data on standard report forms submitted and accepted.
 - 1. Identify equipment by the same symbol or number used on Contract Drawings.
 - 2. Note Work observed that does not conform to the Contract Documents and installations that do not allow the system to be balanced in accordance with the Contract Documents on the report form.

2.2 REPORT DATA REQUIRED

- A. Pumps and associated motors:
 - 1. Tag No., location, and service.
 - 2. Pump nameplate information.
 - 3. Motor nameplate information.
 - 4. Installed thermal overload heater rating.
 - 5. Specified head (FT H₂O).

6. Specified flow (GPM).
 7. Operating head (FT H₂O).
 8. Operating flow (GPM).
 9. Operating temperatures (degrees F).
 10. Pump curve with operating point plotted.
 11. Motor operating voltage and amperage.
- B. Balance valves:
1. Valve no., terminal unit served, location, and size.
 2. Specified flow (GPM).
 3. Operating setpoint.
 4. Operating flow (GPM).
 5. Operating pressure drop (FT H₂O).
- C. Flow control valves:
1. Terminal unit served, location, and size.
 2. Specified flow (GPM).
 3. Pressure drop (psig).
- D. Hydronic Coils:
1. Tag No., location, and service.
 2. Face Area.
 3. Specified capacity (CFM).
 4. Actual capacity (CFM).
 5. Specified flow (GPM).
 6. Operating flow (GPM).
 7. Operating pressure drop (FT H₂O).
 8. Entering Water Temperature (degrees F).

9. Leaving Water Temperature (degrees F).
10. Entering Air Temperature (degrees F).
11. Leaving Air Temperature (degrees F).

PART 3 EXECUTION

3.1 GENERAL

- A. Provide labor, instruments, and materials required to balance and adjust the facility's mechanical systems installed by this Project, including those systems modified as part of this Project, to obtain fully functional and properly operating systems.
- B. Notify Contracting Officer in writing at least ten days in advance as to when balancing is scheduled to commence.
- C. Prior to starting the balancing procedures verify that systems to be balanced are complete, operational, and that:
 1. Filters and strainers are clean.
 2. Controls system installation is complete and controlling systems to be balanced in accordance with the Contract Documents.
 3. Isolation valves or dampers are full open.
 4. All piping and ductwork has been cleaned of construction debris and scale.
- D. Put all mechanical systems and equipment into full operation and continue the same operation during each working day of balancing.
 1. On systems with variable frequency drives (VFD) and belt driven equipment, set adjustable sheaves so that motor operates between 55 HZ to 63 HZ at call for full speed
 2. Coordinate with technician responsible for VFD setup to ensure a maximum speed setting is set to prevent current draw above name plate amperage.
- E. Keep informed of any major changes made during construction and obtain a complete set of As-Built Drawings, computer outputs, etc. before starting balancing.
- F. Document Work observed that does not conform to the Contract Documents.

- G. When Work does not allow the system to be balanced in accordance with the Contract Documents, collect system performance data that will help in determining why the system cannot be so balanced, offer possible corrective action, and otherwise cooperate with the Contracting Officer.
- H. Prior to Substantial Completion Inspection, submit three copies of balancing report for review by the Contracting Officer.
- I. Upon request, recheck random selections of up to ten percent of the data recorded in the balancing report in the presence of the Contracting Officer. Rebalance the mechanical systems, prepare, and submit for review a new report if more than twenty percent of the rechecked readings deviate more than ten percent from the recorded reading in the balancing report.
- J. Upon acceptance of Work by the Contracting Officer, revise balancing report incorporating revised data, description of corrective measures taken to correct previously identified deficiencies, and other Contracting Officer review comments and deliver four record copies of the final report to the Contracting Officer.
- K. Following final acceptance of the balancing report, permanently mark all dampers, valves, and other adjustment devices so that the adjustment can be restored if disturbed at any time.

3.2 HYDRONIC SYSTEMS PROCEDURES

- A. Examine hydronic circulating systems to determine that the systems are at the proper pressures and temperatures and that air is removed from the equipment and piping.
- B. Record voltage and amperage draw of each motor. Record flow and head for pumps. Plot flow and head on manufacturer's pump curve and include with report.
- C. Adjust balancing cocks to obtain the design flows and mark resulting position on each cock. Record terminal unit served, location, type, size, design flow, actual flow, settings, and pressure drop. Flows shall be within ten percent of indicated design. If sufficient pump capacity is not available to obtain indicated flows, distribute shortfall equally amongst all terminal units.
- D. Permanently mark, etched or stamped, balancing cock setpoint scale readings and balanced flow in GPM on one and one-half inch diameter brass valve tags attached to balancing cock with No. 6 bead chain. This tag is in addition to valve identification tag called for elsewhere.

- E. For “smart pumps” using integral control algorithm and integral sensors balance document as follows:
1. With all valves open to heating position operate pump at maximum speed. Record head, current draw.
 2. With all valves open, release pump into automatic control. Record head and current draw.
 3. If algorithm programming requires a maximum head setpoint, obtain head by closing valve directly downstream of pump until design flow is reached. Record pressure just downstream of this throttling valve. Input this head setpoint into pump memory.
 4. If algorithm requires a minimum head setting obtain setting with all control valves closed to heating. Confirm design flow through wild flow circuits and through three way valves.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 09 23 - DIRECT DIGITAL CONTROL SYSTEM FOR HVAC

- A. This Section of the Specification covers design, selection, and installation of direct digital control and monitoring systems.

1.2 QUALITY ASSURANCE

- A. Direct digital control systems provided shall be furnished and installed by a controls contractor who is regularly engaged in the installation of direct digital control systems in Alaska. The controls contractor shall maintain an office in Fairbanks or Anchorage with parts and maintenance personnel to ensure prompt response (24 hour maximum) to an emergency call during the guarantee period.
- B. Controls contractor shall demonstrate that they have experience designing and installing direct digital control systems of comparable type and size to the systems called for in these Specifications.
- C. Controls contractor, if other than the manufacturer, shall hold a manufacturer's franchise or license to design and install control systems for that manufacturer.
- D. Within 2 weeks after the award of contract, submit to the Contracting Officer the following items for Contractor qualification:
 - 1. Name of manufacturer and proof that the control contractors holds a manufacturer's franchise or license to design and install the proposed control system.
 - 2. Proof of Alaskan Office, with full-time service representative.
 - 3. List of Alaskan buildings with names, addresses, and phone numbers of Owners which are representative of direct digital control systems that have been installed by the control contractor. Include a brief description and approximate control system construction cost of each system submitted.
- E. Acceptable Direct Digital Controller Manufacturer's:
 - 1. Siemens Industries, Inc.
 - 2. No substitutions

1.3 GENERAL SUBMITTAL REQUIREMENTS

- A. Reference Division 1 for additional submittal requirements.
- B. Coordinate submittal items with the submittal register as indicated or as revised by the Contractor.
- C. If an item indicated on the submittal register is not used submit an item data sheet correlating to the appropriate item number, specification paragraph and indicate as "Not Used". If a device or component is used that is not indicated on the submittal register or added after the original submittal provide a new submittal register item number appended to the end of the list within the appropriate section.
- D. Prior to programming, ordering of equipment, or installation of any portion of the system submit a single tabbed and indexed submittal package for review by the Contracting Officer.
- E. Copies of Engineer's CAD Drawings in AutoCAD format are available for contractor's use upon request. The contractor may utilize these Drawings as a basis for Shop Drawings, and graphic screens. If used, Contractor is responsible for field verification and modification as required to comply with Contract Documents. No guarantee is made as to the usability of these files to the Contractor.

1.4 BUILDING MANAGEMENT SYSTEM SOFTWARE FUNCTION SUBMITTAL

- A. Submit an index of control, monitoring, and editing functions provided.
- B. If approach is significantly different than indicated, provide data as required to provide a thorough understanding of approach used and how salient features of required functions are maintained.

1.5 SCHEMATIC CONTROL DIAGRAM SUBMITTAL

- A. Correlate sequences and schematic diagrams applications to associated mechanical equipment or applications groups as indicated on the submittal register or provide a new submittal register correlating to grouping used.
- B. Schematic control diagrams 11 inches by 17 inches minimum paper size with upper case lettering, minimum 1/16-inch high plotted from digitized files in AutoCAD format. Include sequence of operations on the schematic control diagrams so that the relevant sequence is on the same diagram with the control schematic it describes. The Sequence of Operations provided in the Contract Documents is written in directive language. Rewrite the sequence of operations to be submitted to the Owner in language that explains the sequences of operation. Remove all directives to the Contractor.

- C. Clearly indicate wire and terminal labels, set points, reset schedules, switch over points, signal ranges, and other points required to completely describe the system. Show interface with any existing control systems. Schematically depict the mechanical system in adequate detail to reflect flow relationships on a system basis. When control diagrams are provided as part of the Contract Documents provide similar level of detail. Depict circuitry on schematic control diagrams to allow circuits to be traced from connection to connection using one of the following methods:
1. Diagram each wire or tube depicting full length of circuit from connection to connection, or:
 2. Reference each wire to a uniquely labeled terminal. Depict terminals on a sequentially labeled terminal strip showing attached wires and the device labels of the components attached at the other end. If the wiring label used is different than the terminal label indicate the wire label. In addition, provide ladder diagrams indicating current or airflow through circuitry components.
- D. Construct digitized schematic control diagrams using a symbol library so that symbols for similar equipment are common. Use separate layers or line type designations for the following items:
1. Device Symbols.
 2. Equipment Symbols.
 3. Piping.
 4. Wiring.
- E. Include the following specific schematic control diagram types, segregate diagrams with tab labels, item data sheets for each type are not required:
1. System architecture diagram showing power supply to each component; interconnection of direct digital controllers, building management station, and peripherals; and indication of proposed location of direct digital controllers.
 2. Riser diagram indicating the circuit designation for each power circuit and showing how each controller and actuator is powered with the location of each power supply or transformer described.
 3. Control Valve Schedule: Provide a schedule of control valves listing the location, valve body model number, Cv Rating, actuator, action (fail open or closed), and close off pressure for each control valve.
 4. Damper Actuator Schedule: Provide a schedule of damper actuators listing the location, size of each damper or damper set, type of damper, actuator model number, action (fail open or closed), torque required and torque provided.
 5. Subpanel and panel face layouts.

6. Heating Plant Control Diagrams.
7. Terminal Unit Control Diagrams.
8. I/O Interface Diagrams correlating I/O on each controller to associated control device.

1.6 PRODUCT DATA SUBMITTALS

- A. Control components data sheets, installation, operation, and adjustment instructions. Further index and tab this Section of the submittal by item number.
 1. Each control component shall be identified with a separate item number. Separate each item with a divider sheet with plastic index tabs.
 2. Precede each item with a completed Item Data Sheet. See required format attached to the end of Section 20 05 11 "Common Submittal Requirements for Mechanical."
 3. Provide two alphabetical listings of all items included in the binder in an index at the front of the binder. Sort one index component functional name. Sort the other index by symbol used in the control diagrams. Include both functional name and symbol in each index. Choose either index to reference item tabs at Contractor's option.
 4. Each sheet or page shall indicate the specific item(s) proposed for this Project. Delete or cross out all other items.

1.7 CLOSEOUT SUBMITTALS

- A. Closeout submittals must be submitted for review, reviewed by the Contracting Officer, corrected in accordance with review comments, and accepted by the Contracting Officer before a request for final or Substantial Completion Inspection will be considered by the Contracting Officer. Provide the following closeout submittal items:
 1. Operation and Maintenance Manuals.
 2. Orientation and training instruction schedule and course outlines.
 3. Printed copies of graphic screens and tabular screens.
 4. A summary or index of history points with the associated sampling rate or sampling criteria.

1.8 OPERATION AND MAINTENANCE MANUALS

- A. The Operation and Maintenance Manual shall include the information required for the equipment review submittal, updated as required to reflect current As-built conditions, plus the following:
1. A brief customized guide to system operation prepared for the building management system. Include copies of the guide in the Operation and Maintenance Manual and in a separate three ring binder with sheet protectors to use at each workstation. The guide shall include:
 - a. Log on procedure.
 - b. Custom commands with examples.
 - c. Procedure for accessing interactive video display screens, changing set points, acknowledging alarms, creating history logs, and reviewing history logs.
 - d. List of history logs.
 - e. List of interactive video display screens.
 - f. List of commands required to back up the building management system and start up the system after a hard disk failure.
 - g. List of commands required to back up individual direct digital controllers and start them up after a controller failure.
 2. Maintenance information and parts lists for control components.
 3. Complete system as-built wiring diagrams indicating the following:
 - a. Wiring for all control and power circuits indicating the voltage and breaker location for each circuit.
 - b. Wiring for direct digital controllers and interface panels.
 - c. Terminal number or code name for terminals in direct digital controllers and interface panels with unused terminals marked "spare."
 - d. Assigned name, address, and engineering units for direct digital controller input and output terminals.
 - e. Location, identification tag, type, function, and wiring for sensors, switches, relays, damper and valve operators, and other control system components.
 4. List of software with current revision numbers.

5. Indicate on the Record Drawings the location of control devices and panels that are not physically attached to mechanical equipment and that are not already indicated on the construction documents. Baseboard valves and VAV box controllers are excluded from this requirement as they are understood to be in the proximity of the baseboard and VAV boxes they serve.
 6. Provide reloadable backup copy of programming and variable printouts for the direct digital control computers created to fulfill the sequence of operation requirements. Provide on USB.
 7. Provide digitized copies of as built schematic control diagrams, wiring diagrams, and graphic screens recorded on USB in dxf drawing interchange file format and pdf.
 8. Provide other information required to properly troubleshoot and maintain the control system.
- B. Submit index table of histories to be provided as part of final inspection for review concurrently with Operation and Maintenance Manual.
 - C. Published and bound building management system software or hardware manuals are not required to be included in the three ring "Operation and Maintenance Manual." Provide one copy of each published and bound building management system software or hardware manual required for the maintenance and operation of building management system to the Project Manager one week prior to request for Substantial Completion. Provide a separate index sheet describing each separately provided bound manual as part of the "Operation and Maintenance Manual."
 - D. Provide editing facilities used in the developing of the building management system so that any custom programming required to apply the building management system to this Project is accessible to a trained operator for viewing, editing or creating similar software structures. List software that cannot be changed by the operator with model and version number. Any custom software is considered the property of the owner with full right to copy.
 - E. After the final inspection and subsequent punch list inspections, update each copy of the Operation and Maintenance Manual to reflect final As-built conditions.

1.9 SYSTEM DESCRIPTION AND ARCHITECTURE

- A. Direct digital control (DDC) is defined as a control technique through which the process variable is continuously monitored by a direct digital controller, which accomplishes loop control by calculating a control solution for output to a control device.
- B. Building Management System (BMS) is defined as the computer hardware, peripherals, software, and custom programming required to provide the indicated BMS functions.

- C. Workstation is defined as a microprocessor containing BMS software and custom programming in memory.
- D. A file server if indicated is defined as a microprocessor used to integrate multiple workstations and contains BMS software and custom programming in memory. Where workstation functions are described in the specifications they also apply to a file server.
- E. A workstation or file server is defined as: local, if located at the project site; remote, if located off site; or portable, if it resides in the form of a laptop.
- F. Provide direct digital controls unless otherwise indicated. Provide a direct digital control system consisting of a building management system, one or more direct digital controllers, and the panels, sensors, transducers, switches, operators, control valves, control dampers, and other devices required to perform the automatic control and monitoring functions described herein and indicated on the Drawings.
- G. Operator communications with the system shall be through the building management system.
- H. Provide a building management system consisting of a local workstation as well as access and capability to perform building management system functions using Java enabled browsers without requiring proprietary operator interface and configuration programs. Provide the capability for communications to a remote computer through a TCP/IP LAN connection and a telephone modem.
- I. Provide a system capable of supporting five simultaneous users using a standard web browser such as Internet Explorer or Mozilla Firefox operating on any standard computer that supports the current version of Internet Explorer or Mozilla Firefox. Access to this web based service is provided without charge for the lifetime of the control system.
- J. Communication Networks
 - 1. Provide two, and if required three, communications networks N1, N2, and N3. Use N1 network for communications between the components of the building management system and the direct digital controllers. Use N2 network to communicate between direct digital controllers. Use N3 network if a third network is required to communicate between different tiers of controllers. Use no more than three networks. Provide networks with sufficient data rates to allow for updating all system points to the building management system every 10 seconds. Failure of a direct digital controller shall not cause loss of communications of the remainder of any network.
 - 2. Provide controller to controller communications through dedicated network or networks independent of fire system, security system, or facility wide TCP/IP internet communications. Communication between workstations and controllers may use facility wide TCP/IP internet networks.

3. The N1 and N2 networks are to be a TCP/IP communications network using telephone line communications as a backup.
4. Provide N3 network using RS-485 bus architecture, or independent ethernet bus. Provide signal repeaters as required by controller manufacturer installation instructions if signal must be enhanced due to bus length or number of connected devices. If ethernet bus is used, dedicate bus to temperature control system only.
 - a. Provide direct digital controllers that comply with IEEE-587 Categories A and B (ANSI C62.41) standard for Transient Surge withstand capabilities for electrical devices.
 - b. Issue a maintenance alarm upon failure of any direct digital controller to communicate the building management system for longer than ten seconds.

PART 2 PRODUCTS

2.1 BUILDING MANAGEMENT SYSTEM

- A. If BMS communications software is provided on the basis of site licenses provide a minimum of five site licenses.
- B. Building Management System Functions:
 1. General:
 - a. Provide workstations complete with equipment and software necessary to allow the required functions to process automatically, to be interacted with by a trained operator, and to be controlled by a trained operator, while the associated direct digital controllers are operating and performing other control functions and without interrupting the alarm processing and annunciation function.
 - b. Provide editing facilities so that any custom programming required to apply the building management system to this project is accessible to a trained operator for viewing, editing or creating similar software structures. List software that cannot be changed by the operator with model and version number. Any custom software is considered the property of the Owner without regard to copyright.
 - c. Provide the following building management system functions:
 - 1) Password Control.
 - 2) System Monitoring.

- 3) Direct Digital Controller Program Editing.
- 4) Building Management System Software Editing.
- 5) Alarms Processing and Annunciation.
- 6) Printer Control.
- 7) Remote System Telephone Communications.
- 8) Ethernet Communications.
- 9) Historical Data Logging.
- 10) Data Graphing.
- 11) Building Management System Database Operations.
- 12) Third Party Software Utilization.

C. Building Management System Hardware:

1. Provide components complying with FCC Part 15, Subpart J: Class B Compliance.
2. Local Workstation:
 - a. Provide a desktop workstation with the following:
 - 1) Current generation Intel based dual-core processor or better.
 - 2) Minimum of 8 Gigabyte RAM memory.
 - 3) Minimum of 250 Gigabyte SSD hard disk.
 - 4) Ethernet 10/100/1000 Base-T Gigabit network interface card (NIC).
 - 5) Full size 101 key keyboard.
 - 6) LCD flat screen, minimum 18-inch color monitor.
 - 7) Optical / laser mouse.
 - 8) Current version of Microsoft based operating system compatible with controls vender software.
 - 9) Provide Dell Inspiron, Hewlett Packard, IBM or equal.

- b. Wall mount desktop CPU bracket: Provide a wall mount bracket for the desktop workstation. Minimum 14-gauge steel with powder coated black paint and velcro strap, Kendall Howard, VIVO, Star Tech, or equal..
- c. Keyboard shelf: Provide a wall mount bracket with extendable mouse shelf. Minimum 16-gauge steel with powder coated black paint, ICC or equal.

2.2 DIRECT DIGITAL CONTROLLERS

A. General:

1. Provide modular direct digital controllers unless otherwise indicated. Application specific controllers may be used in lieu of modular direct digital controllers for fin tube radiation, unit heaters, and cabinet unit heaters. Network controllers may be used in lieu of modular direct digital controllers to provide communication functions.
2. Provide direct digital controllers capable of performing its designated control functions in a completely independent manner and continuing its primary control functions during network communications failure.
3. Control points monitored or controlled by a direct digital controller shall be individually addressable. Full history accumulation shall be possible for all control points. Use of multiplexors is not acceptable.
4. Provide direct digital controllers to the following standards:
 - a. FCC Part 15, Subpart J: Class A Compliance.
 - b. UL listed for control of mechanical systems or temperature regulating systems.
5. Provide direct digital controllers with diagnostic LED indication of device transmit and receive data communications, normal operation, abnormal operation and control relay operation indication. Provide direct digital controllers with self-diagnostics programming that continuously monitors the proper operation of the microcomputer controller.
6. Provide each direct digital controller with its own microcomputer controller, power supply, input/output modules, and termination modules.
7. Provide one direct digital controller with Ethernet communications interface utilizing TCP/IP protocol fully compliant with IEEE 802.3 and supporting third party communication devices such as transceivers, bridges and routers with connections for 10BaseT, 10Base5 or 10Base2 cabling.

8. Provide one direct digital controller with the following modem: 56 kbps autodial, auto ranging modem, Hayes compatible with Hayes "AT" command set. Automatic transmission speed adjustment, error checking, and 4:1 data compression, compatible with BELL 103, BELL 212A, CCITT V.32, CCITT V42bis protocols. Hayes Optima or equal. This controller is to provide remote communication to all remaining controllers in the facility.
9. Provide one direct digital controller with the following modem: 9600 bps autodial, auto ranging modem, Hayes compatible with Hayes "AT" command set. Automatic transmission speed adjustment, error checking, and 4:1 data compression, compatible with BELL 103, BELL 212A, CCITT V.32, CCITT V42bis protocols. Hayes Optima or equal. This controller is to provide remote communication to all remaining controllers in the facility.
10. Provide direct digital controllers with commanded override capability through the building management system via network communications and through direct connection to the portable operator terminal. Annunciate such overrides to the workstations.
11. Each direct digital controller shall be capable of full operation either as a completely independent unit or as a part of the entire control system. Provide each direct digital controller with equipment required for interface to its associated input and output devices.
12. Program each direct digital controller using the same set of programming languages. Do not use programming customized specifically for this project that is inaccessible to a trained operator. All accessible programming becomes the property of the Owner without regard to copyright.
13. Provide direct digital controllers with a minimum point name length of eight alphanumeric characters.
14. Provide direct digital controllers capable of retaining volatile memory for a minimum of 24 hours after loss of power to the microcomputer controller. Loss of power to any direct digital controller shall not affect operation of other system direct digital controllers. Loss of power to any direct digital controller shall be reported to the operator through the building management system as a maintenance alarm. Upon resumption of power, the direct digital controller shall resume full operation without operator intervention.
15. Provide direct digital controllers with a minimum of one operator service port for the connection of the Portable Operator Terminal to perform indicated functions.

16. Automatic control and monitoring functions shall be executed within direct digital controllers. Execute loop control via direct digital control algorithms. The direct digital controllers shall permit development of control loops that support any of the following control modes:
 - a. Two-position: on/off, open/closed, pulse width modulated, etc.
 - b. Proportional (P): Causes actuator to stroke to a position proportional to the offset from setpoint. Provide with positive positioning actuator or potentiometer feedback from actuator, and proportional band adjustment.
 - c. Integral (I): Causes actuator to change position in response to offset from setpoint and accumulated time of offset. Provide with adjustable gain.
 - d. Derivative (D): Adjusts signal to actuator based on rate of change in offset from setpoint. Provide with adjustable gain. Apply only in conjunction with proportional and integral control.
 - e. Proportional plus integral (PI).
 - f. Proportional-integral-derivative (PID).
17. Provide direct digital controllers that allow development of operator programmable control strategies and alarm conditions, capable of incorporating arithmetic, Boolean, and time delay logic. The arithmetic functions shall permit complex variable relationships (i.e. square root, exponential) as well as the more simple relationships (i.e. +, -, /, x). Provide the following logic constructs: and; or; not; nor; equal to; not equal to; less than; greater than; minimum of a group; and maximum of a group. Provide time delay values adjustable in seconds, minutes, hours, days, and date of year.
18. Provide direct digital controllers capable of using each of the following input and output types:
 - a. Analog input within the range of 0-10 VDC, and 4-20 ma.
 - b. Digital input, sensing dry contact closure.
 - c. Pulse accumulator input able to totalize pulse input at a minimum rate of two hertz.
 - d. Temperature input providing automatic conversion to temperature selectable in either degrees F or C.

- e. Digital output capable of pulsed momentary and maintained output with a minimum resolution of 0.10 seconds and selectable from 0.10 to 3200 seconds.
 - f. Analog voltage output providing a minimum output range from 0-10 VDC with a resolution of 0.10 VDC.
19. Inputs shall have a minimum accuracy of plus or minus 15 mV, and a resolution of 4.8 mV from 0 degrees F to 100 degrees F ambient. Outputs shall have a minimum accuracy of two percent output span and a minimum resolution of one percent output span.
20. Provide direct digital controllers that allow each control loop to be fully operator definable in terms of:
- a. Sensors/actuators.
 - b. Setpoints.
 - c. Control modes.
 - d. Gains.
 - e. Control actions.
21. Provide direct digital controllers that permit the generation of job-specific control strategies that can be activated in any of the following ways:
- a. Continuously.
 - b. At a particular time of day.
 - c. On a pre-defined date.
 - d. When specific variable reads a selected value or state.
 - e. When a piece of equipment has run for a certain period of time.
 - f. When specific variable changes state.
- B. Network Controllers:
- 1. Provide network controller to perform indicated communication functions in lieu of modular direct digital controller at Contractor's option.
 - 2. Network direct digital controllers to allow for single point system programming and monitoring from the building management system and for the sharing of point information and control instructions.

- C. Modular Direct Digital Controllers:
1. Provide modular direct digital controller with the capability of utilizing the following input and output types. If the Input / Output (I/O) hardware is modular, the controller must utilize these types without the necessity of changing the back frame:
 - g. Analog input.
 - h. Digital input.
 - i. Pulse accumulator input.
 - j. Temperature input.
 - k. Digital output.
 - l. Analog voltage output.
 - m. Analog current output.
 2. Provide modular controllers with a minimum of eight input and eight output locations. If I/O hardware modules plug on to a base, cover unused locations with a blank cover.
 3. Each controller shall have a minimum of one spare input and one spare output.
 4. Provide manual overrides on each output. Digital outputs to have hand off auto switch interlocked with LED lights showing condition of output. Analog outputs to have hand off auto switch interlocked with LED status lights, and an additional potentiometer allowing the value of the output signal to be manually adjusted while the output is overridden in hand. Such overrides shall be annunciated to the workstations.
 5. Leave every 10th assignable item as spare for the Owner's future use. This includes software entities such as blocks, variables and flags; therefore, any assignable item ending in 0 shall be left as spare.
 6. If non structured programming or I/O is utilized, ten percent of total point space and available programming area shall remain unused, and 10 percent unused I/O modules shall be plugged in to the back frame in proportional distribution and type to the point distribution and type used on the project.
 7. Where controllers are installed together on the same back panel surface and are connected together with a conduit system allowing future conductor installation the required spare I/O may reside on a single controller. Provide ten percent unused inputs and ten percent unused outputs in proportional distribution and type to the point distribution and type used on the Project.

D. Applications Specific Direct Digital Controllers:

1. Application specific controllers may be used for control of fin tube radiation, unit heaters, and cabinet unit heaters.
2. Provide application specific controller with nonvolatile programmable memory.

2.3 AUTO DIALERS

- A. Auto Dialer: Dialer initiates phone call and sends message upon any of 4 contact closures sensed. Similar to Sensaphone.

2.4 TEMPERATURE SENSORS

A. General:

1. Unless otherwise indicated provide two wire sensors for remote sensing. Factory calibrate for the specific application.

B. Space Temperature:

1. Thermistor or RTD with minimum 32-130 degrees F range, accuracy of plus or minus 0.4 degrees F over full range, and maximum drift of 0.1 degrees F/year. Removable covers with tamper proof fasteners. Similar to Precon ST S E series.
2. When temperature sensor is connected to an application specific controller, provide with an RJ-11 jack so that the portable operators terminal can be connected at the temperature sensor.
3. In single occupant offices, provide with LCD display temperature indication and setpoint adjustment as part of cover. In all other spaces, provide without temperature indication or setpoint adjustment.

C. Space Temperature - Tamper Resistant:

1. In the Gymnasium and where tamper resistant sensors are indicated in plan, provide temperature sensor bonded to a stainless steel handy box cover plate.
2. Provide sensor with logo decal and insulated back.
3. Precon ST-S or equal.

D. Fluid Temperature:

1. Thermistor or RTD with minimum 30 degrees F to 230 degrees F range, accuracy of plus or minus 1 degree F over full range, and maximum drift of 0.5 degree F per year. Similar to Precon ST-W series.
2. Insertion bulb type including well to allow removal of element without draining system.

E. Outside Air Temperature:

1. Platinum RTD with minimum minus 58 degrees F to 110 degrees F range, Accuracy of plus or minus one degree F over full range, and maximum drift of one degree F per year. Similar to Precon ST O series.
2. Remote bulb sensing element with ventilated sun shield and weatherproof box.

2.5 PRESSURE SENSORS

A. General:

1. Unless otherwise indicated provide two wire sensors for remote sensing. Factory calibrate for the specific application.

B. Fluid Pressure:

1. Semi-conductor strain gauge pressure transducer with range 150 percent of operating pressure and over pressure tolerance of 200 percent of range pressure, plus or minus two percent accuracy over full range, and maximum drift of one percent full range per year. Similar to Kele PTX1E.
2. Watertight enclosure.
3. Provide with brass or stainless steel snubber and pigtail on steam applications.
4. Provide with gate or ball valve isolation.

C. Fluid Differential Pressure:

1. Ni-Span C capsule coupled to an LVDT displacement sensor with range 150 percent of operating pressure and over pressure 150 percent of range pressure, accuracy plus or minus two percent over full range, and maximum drift of one percent full range per year. Similar to Schaevitz P-3081.
2. Provide with gate or ball valve isolation.

2.6 OTHER SENSORS

A. General:

1. Unless otherwise indicated provide two wire sensors for remote sensing. Factory calibrate for the specific application.

B. Current Sensor:

1. Current transformer and conditioning circuitry to convert 0-20 amps AC line current to 0-5 VDC input directly, and 20 to 5,000 amps AC using an auxiliary current transformer. Similar to Veris Hawkeye.

2.7 THERMOSTATS AND TEMPERATURE SWITCHES

A. Line Voltage Thermostat - Space Temperature:

1. Provide where non-DDC space temperature control is indicated.
2. Adjustable setpoint, room temperature and setpoint indication.
3. Switching through SPDT contacts rated 16 amp inductive current at 120V.
4. Setpoint range: 50 degrees F to 80 degrees F minimum setpoint adjustment range.
5. Removable setpoint adjustment knob.
6. Covers: Removable and without temperature or setpoint indication unless specifically indicated otherwise.
7. Mount covers to bases with tamper proof fasteners.
8. Schneider Electric TC-1100 or equal.

B. Thermostat Guard

1. Where indicated provide vented guard with lockable cover. Similar to Kele BAPI.

C. Space Low Voltage Thermostats:

1. Adjustable setpoint, adjustable calibration of setpoint, room temperature indication, setpoint index, heat anticipator.
2. 50 degrees F to 90 degrees F minimum setpoint adjustment range.
3. Mercury free, mechanical switch with no battery. 24 VAC. Similar to White Rodgers 1E30N-910.

2.8 LIQUID LEVEL SWITCHES

A. Liquid Level Switches:

1. Mechanical switch in polypropylene casing with appropriate length cable.
2. Similar to Flygt ENM-10.

2.9 OTHER SWITCHES

A. Current Switches:

1. Current operated solid-state switch with adjustable switch point, and selectable range combined to provide 1 to 135 amp setpoint range. Similar to Veris Hawkeye.
2. Internal circuits powered by induced line current.

2.10 SIGNAL CONDITIONERS

A. Temperature Transmitter:

1. Two wire, 4-20ma loop powered 1000 ohm platinum RTD temperature transmitter, with adjustable setpoint, and selectable range. Similar to Kele Model ST-T91.
2. Select range with mid range at setpoint.
3. Accuracy, 0.1 degree F or 0.2 percent of span.
4. Enclosure with LED display.

B. Output Override Module:

1. Circuit board mounted auto/manual switch and knurled stem adjustment potentiometer to allow operator to place an analog output into manual mode independent of associated direct digital controller output. Similar to Advanced Control Technologies MAO.
2. Provide with labels indicating associated output.

C. Output Transducers:

1. Electronic/Pneumatic Transducer: Transducer to convert electronic 0-10VDC, or 4-20mA analog input to pneumatic proportional 3-15psi linear output, one percent linearity full range, track mountable. Similar to Kele UCP-422.

2.11 CONTROL RELAYS

- A. General: Provide relays rated for current and voltage requirements of controlled equipment.
- B. Panel Mounted Relays:
 - 1. Plug in type, with DIN rail mountable plug in sockets. Similar to IDEC RH series.
 - 2. UL listed.
- C. Field Mounted Relays:
 - 1. Solid-state packaged relay including relay, LED indicator, provisions for mounting, transient protection and housing. Similar to Functional Devices RIB T series.
 - 2. Where manual override is required, provide with a Hand-Off-Auto switch.
 - 3. Provide internal separation between class 1 and class 2 wiring including separate wire ways or nipples.
 - 4. UL listed.

2.12 METERS

- A. General:
 - 1. Remote communications capability as well as have a continuous manual reading option.
 - 2. Utilities to be monitored to a resolution of one percent deviation from actual and shall be reported and totalized.
- B. Condensate Meter:
 - 1. Inline turbine flow meter suitable for condensate water, electronic impedance sensing, liquid temperature up to 300 degrees F, max operating pressure of 400 psi, max pressure drop of three psi, and contact output signals. Similar to Onicon F-1330.

2.13 GAUGES AND INDICATORS

- A. Differential Pressure Gauge – Water:
 - 1. Diaphragm actuated 4-3/4 inches O.D. dials with magnetically coupled needle, plus or minus two percent accuracy full scale. Scale range to match sensor or switch.
 - 2. Similar to Dwyer Capsuhelic series.

2.14 CONTROL VALVES

- A. Steam Control Valves: Single seated, two-way, straight through type with top and bottom guides or cage trim guides, stainless trim, equal percentage V-port throttling characteristics, 30 to 1 range-ability, tight shut-off, and body rated for 125 PSIG steam.
- B. Two-Way or Three-Way Hot Water Control Valves: Ball valve, 400 psig rated, with 100 psig close off pressure, 240F fluid temperature. Forged brass body with chrome plated or stainless steel ball. Similar to Belimo.
- C. Terminal unit control valve, modulating or two position as indicated: Equal percentage self cleaning two-way threaded ball valve. Teflon PTFE seats, EPDM O rings, compatible with 60% glycol, rated for 212 degrees F fluid temperature, at 360 psi, with 75 psi close off pressure. Modulating 2-10 VDC or two position 24 VAC power, 3 watts max running, current. Set adjustable Cv to 3.5 unless otherwise indicated. Unnoticeable noise during operation. Similar to Belimo Zonetight.

2.15 WIRING AND RACEWAYS

- A. Provide wiring and raceway complying with the National Electrical Code, Division 26, and State and Local Codes and Ordinances.
- B. Raceways:
 - 1. EMT, metal duct, IMC, rigid conduit, surface metal raceways, or totally enclosed metal trough with flexible metal tubing.
- C. Wiring:
 - 1. Provide wire with copper stranded conductors. Provide color or number coded jackets.
 - 2. Low voltage wiring from control components to input/output modules: 20-gauge minimum conductor size, multiple conductor cable rated 100 VDC at 80 degrees C.
 - 3. Provide plenum rated cable whenever wire is run without conduit. Coordinate cable sheath color with other trades so that control cable color is different than communication or lighting control cable color.
 - 4. Provide communications network wiring meeting the gauge, impedance, capacitance, resistance and shielding requirements specified by the manufacturer of the connected devices.
 - 5. Identify wires and cables with permanent self-laminating machine print labeling system. Provide labels capable of receiving eight characters of type written text, with minimum print on area of 1-inch by 1/2-inch, and protected by a clear sheath. Similar to Thomas & Betts E-Z Code.

6. Support or bundle wire with self-locking, UL listed cable ties. Provide 40 pound rated cable ties incorporating a stainless steel locking insert. Provide UL 94V-0 flammability rated, halar cable ties when installed without panel enclosure. Similar to Thomas & Betts Ty-Rap.
7. Provide cable tie anchors designed for mechanical anchoring, allowing removal of cable tie without removal of anchor, capable of accepting at a minimum a number 8 screw. Adhesive cable tie anchors are allowed only on the interior surface of panel doors. Similar to Panduit TM series.

2.16 PANELS

A. General:

1. UL listed, not over 24 inches wide by 42 inches high, constructed of 14 U.S.S gauge steel except that enclosures less than 20 inches in both dimensions may be 16 gauge. Provide multi-section or multiple individual panels as required. Similar to Hoffman.
2. Equipped with subpanels.
3. Punched or stamped to receive front mounted switches, gauges, indicating lights and alarms.
4. Secure to the front of every control panel that has more than one source of power the following warning label: The word "WARNING" shall be in 1-inch high letters. Other letters shall be 1/4-inch high.
 - a. WARNING Complete de-energization of this control panel requires that circuit breakers supplying all equipment controlled by this panel be opened.
5. Provide track-mounted terminals with integral permanent labeling system. Integral screws for securing connected wires. Voltage and amperage ratings to match terminated wire ratings. Similar to Marathon.
6. Support or bundle wire with hook and loop cable ties specifically designed for this application with eyelet head and body. Provide ties properly sized for each application, minimum overlap of 2 inches. Cut off excess end more than 3 inches. Tensile strength 18 pounds. 200 degrees F operating temperature. Up to 50 application cycles. Similar to Velcro brand.
7. Provide nylon insulated crimp connectors with voltage and amperage-rating matching connected wire ratings unless terminal strip is designed to connect to connected wire type without using a crimp connector. Similar to Thomas & Betts STA-KON connectors.
8. Indicating lamps on panel shall be long life type, rated for a minimum life of 10,000 hours.

- B. Interior Enclosures:
 - 1. Piano hinged front with latch and lock.
 - 2. Baked enamel finish.
 - 3. Concealed enclosures may be standard electrical boxes.
- C. Exterior panels:
 - 1. Provide NEMA 4 rated enclosure whenever panel is located in exterior locations.
 - 2. Indicating lamps for exterior locations shall be long life with bezel gasket. Similar to Square D Class 9001.
 - 3. Exterior Alarm Horn: Gray baked enamel coating, 86 db output, fitted for exterior service. Similar to Edwards System Technology 340-NS.
 - 4. Exterior Alarm Light: NEMA 4x vertical mounted, steady LED light with red lens.

PART 3 EXECUTION

3.1 GENERAL:

- A. Work is to be performed by trained mechanics and installed in a first-class, neat and orderly manner.
- B. Do not install control devices in locations where they are subject to damage or malfunction due to normally encountered ambient temperatures.
- C. Schematics and diagrams, when indicated on the Drawings, show approximate functional relationships and sequences only. All required devices are not shown. Contractor is responsible for providing all components required for a complete functioning system selected to meet the specific functional requirements of each application.
- D. Hard wire control devices. Do not use power line carriers or wireless communications.
- E. Ensure that the N1 network software and hardware will support a 50 percent increase in both network length, and attached workstations without having to add signal repeaters, or change workstation or file server software or hardware.
- F. Ensure that the direct digital controller network, N2 or N3, and power wiring will support both a ten percent increase in network length, and a ten percent increase in controllers similar to those installed without having to add additional network repeaters, increase power wire size or circuit breaker capacity.

- G. Unless indicated otherwise, connect the primary sensing input and the associated output for each control loop to the same controller. A secondary or resetting input may be attached to any controller and communicated over the network.
- H. After the final inspection and subsequent punch list inspections provide wiring schematic and Control Drawings with written sequence of operations, 11 inches by 17 inches in size, reduced from the as-built Control Drawings. Provide one copy in each Operation and Maintenance Manual, and one copy laminated in heavy clear plastic, at its applicable control panel. Provide one set of backup tapes and disks necessary to restart and reload all programmable devices used in the control system.
- I. Tune control loops to respond quickly to control fluctuations without hunting.
- J. Label control devices mounted in the field and within control cabinets with 1/4-inch high white embossed letters and black tape background. Dymo or equal. Symbol to match symbol used on Control Drawings.

3.2 DEMOLITION

- A. Remove and salvage for the Owner existing valves, dampers, operators, sensors, and controllers that are replaced by new devices or that are not reused.
- B. Existing conduit may be reused when available. Remove existing unused conductors. Remove empty conduit that served demolished devices back to first junction box and seal conduit opening in box.

3.3 BUILDING MANAGEMENT SYSTEMS

- A. Password Control:
 - 1. Protect access to the direct digital control system through the building management system using passwords for the following levels:
 - a. Level 1, access for monitoring purposes only shall not require a password.
 - b. Level 2, Level 1 plus access to acknowledge alarms.
 - c. Level 3, Level 2 plus access to interact with monitoring screens.
 - d. Level 4, Level 3 plus access to edit direct digital controller programming.
 - e. Level 5, Level 4 plus access to edit Building Management System database and user passwords.
 - 2. Upon restarting or rebooting building management system, automatically set the system to Level 1 access.

- B. System Monitoring:
1. Graphically represent the status of all DDC points.
 2. Provide graphic screens and tabular screens employing browser-like functionality for ease of navigation including a tree hierarchical structure, forward and back buttons and a home button for the following:
 - a. Obtain information about system performance.
 - b. Change set points.
 - c. Diagnose system malfunctions.
 - d. Turn equipment on/off and modify schedules.
 - e. Disable/enable points, and modify disabled points.
 - f. Enable or disable control strategies.
 - g. Simulate system sequences with substituted inputs or outputs.
 - h. Choose optimum loop parameters for loop control.
 - i. Obtain point address names.
 - j. Acknowledge system alarms.
 3. Update displayed data values to these screens and download operator commands from these screens a minimum of every ten seconds. Depict screen values in same engineering units described in the sequence of operation. Graphically represent mechanical systems being controlled.
 4. Provide graphic screens with the following features:
 - a. Current set points, operating temperatures, pressures, pressure differentials, humidity's, flow rates, etc. displayed at sensor locations.
 - b. Animate pumps and fans to simulate an operating condition.
 5. Provide the following tabular screens. Indicate on the screens; the time of day, the outside air temperature, and the screen title.
 - a. Facility alarms summary: Indicate unacknowledged alarms for the facility. Sort alarms by priority level then chronologically with all unacknowledged alarms before uncleared alarms.
 - b. Occupancy schedules: Indicate operation schedules for the floor plan area selected.

- c. Current point values: Indicate current values of all inputs, outputs, and named parameters for selected zone.
 - d. Control program documentation: Display programming for selected zone.
 - e. Equipment operation schedules.
- C. Direct Digital Controller Program Editing:
- 1. Provide interactive editing screens to facilitate the following editing operations:
 - a. Selection points to be alarmed and definition of alarm conditions.
 - b. Selection of and adjustment of start-up time for mechanical equipment after power failure.
 - c. Development of new system sequences and editing of existing sequences.
 - d. Assignment of sensors, points, and actuators to a control strategy.
 - e. Labeling of parameters and variables with names or acronyms of a minimum of eight characters of either text or numerals.
 - f. Choose optimum loop parameters for loop control.
 - 2. Provide the building operator the capability of automatically up loading and down loading a program change to controllers with similar sequences with only one command after selection set is specified. Allow the operator to select one or more controllers, up to all controllers.
- D. Building Management System Software Editing:
- 1. Provide editing menu screens for the following building management functions so that the operator can change conditions, set points, and add or delete points without the necessity of re-entering the individual menu item name:
 - a. Equipment schedules.
 - b. Start-up after power failure schedule.
 - c. Alarms processing and annunciation.
 - d. Historical data.

2. Provide a graphic screen editing facility so that the operator, through the mouse interface, can redraw graphic screens and symbols, animate items such as valves and dampers to reflect dynamic position, set the limits at which the dynamic colors change state and choose the color code for each region with up to 15 colors ranging from blue (cold) to green (normal) to red (hot). Provide complete with symbol libraries of standard mechanical systems, sensors, actuators and common electrical systems and components.
- E. Alarms Processing and Annunciation:
1. General:
 - a. Provide software to report alarms and display a message for each alarm annunciated that describes the alarm priority level, the point type, location, and problem.
 - b. Provide a message or icon that displays on current task screen indicating unacknowledged critical alarms.
 2. Alarm Annunciation:
 - a. Assign critical alarms to highest alarm priority level. Cause a critical alarm message or icon to display on the current building operator task screen. Upon critical alarm, update workstation alarms indicator window, log alarm in critical alarms file, and print alarm message to alarm printer when provided.
 - b. Assign maintenance alarms to second priority level. Upon maintenance alarm, log alarm in maintenance alarms file.
 3. Remote Alarm Notifications:
 - a. Report critical alarms through Sensaphone to owner representative.
- F. Network Communications:
1. Provide one direct digital controller with Ethernet communications interface utilizing TCP/IP protocol fully compliant with IEEE 802.3 and supporting third party communication devices such as transceivers, bridges and routers with connections for 10BaseT, 10Base5 or 10Base2 cabling.
- G. Historical Data Logging:
1. History Logs: Provide a facility to sample & log selected point values. Sampling may be based on change of value for digital input or output points or based on a rate adjustable from one minute to one week, in minute increments.
 2. Provide the following history logs:
 - a. Each input and output value at half hour intervals for the previous 24 hours.

- H. Data Graphing:
 - 1. Provide plotting software integrated with building management system software, which will enable the building operator to print, or display on screen, X-Y graphic plots of specific history data.
 - 2. The plotting software shall permit the user to select points or values plotted, graph type, scale range or auto ranging of scales, legends and graph title. Upon selection, the software shall automatically plot without further intervention.
- I. Provide the facility to upload history data automatically to third Party software.
- J. Building Management System Database Operations:
 - 1. Provide utility capable of uploading and downloading onto the system hard drive, or USB, the entire workstation database, the database less accumulated histories, and selected portions of the software. This shall be accomplished via remote communication or direct connection.
- K. Third Party Software Utilization:
 - 1. Provide the capacity to run specific third-party software packages for word processing, spreadsheets, or database management programs. Use of third-party software shall operate concurrently with other tasks such as alarm logging, and report data gathering.

3.4 PIPING

- A. Permanently label pneumatic tubing at each end indicating the device at opposite end. At the direct digital controller end use either the I/O address, if it describes the connected device or the unique control device tag used on the control schematics. At the device end indicate both the terminal number and the controller connected at the other end.
- B. Install piping in a neat and orderly manner generally running piping and wiring along building lines.
- C. Support rigid copper control tubing at a maximum of 6 feet between anchors. Support polyethylene tubing run without conduit at a maximum of 4 feet between anchors.
- D. Install rigid copper tubing in exposed areas or install tubing within conduit system.
- E. Support and conceal piping in finished areas.
- F. Do not install pneumatic tubing exterior of building vapor barrier or envelope except as required to sense outdoor static pressure.

- G. Unless otherwise indicated test piping on high pressure side of pressure regulating valve at 100 psig. Test piping on low-pressure side of pressure reducing valve at 30 psig or 150 percent of the operating pressure, whichever is greater. System pressure drop not to exceed 5 psig during 24-hour test period.
- H. Pressure tests on tubing used for static pressure sensing are not required.

3.5 WIRING

- A. Permanently label electrical or electronic wiring at each end indicating location and the device at opposite end. At the direct digital controller end use either the I/O address, if it describes the connected device or the unique control device tag used on the control schematics. At the device end, indicate both the terminal number and the controller connected at the other end. For color-coded multi-conductor cable label cable sheath not individual conductors.
- B. At field devices where conductors are not wired to terminal strips, wire using a unique color for each conductor connected to that device.
- C. Install wiring in a neat and orderly manner generally running along building lines.
- D. Wire all electrical controls and switches furnished under this Section of the Specifications. Conceal wiring in finished areas.
- E. Make wire connections using factory fabricated jack assemblies, terminal strips, or solder connections. Use crimp connectors on stranded wire unless connecting to terminal strips approved for direct stranded wire connection. Insulate solder connections with heat shrink tubing. Field connections in control power wiring circuits may be made using wire nuts.
- F. Avoid splices in signal wire, where unavoidable connect with solder connections and label on each side of splice. Use identical wire type and color on each side of splice.
- G. Install N1, N2, and N3 network wiring in dedicated conduit. Oversize network conduit one pipe size greater than minimum required by the NEC for wire fill used.
- H. Connect each direct digital controller diagnostic port to an RJ-11 jack on the room sensors. If there are more than one room sensor per controller, connect to one and indicate that sensor on As-built Drawings.
- I. Unless otherwise noted, install wiring inside conduit or fully enclosed metallic raceway.
- J. Low voltage wiring installed in concealed accessible locations may be run without conduit. Sleeve wiring at wall penetrations.

- K. Support low voltage wiring run without conduit at a maximum of four feet between anchors.
- L. Install all wiring in accordance with National Electrical Code, Division 26, and State and Local Codes and Ordinances.

3.6 PANELS

- A. Provide third party listed panel assemblies.
- B. Mount control devices other than sensors and operators in panels on the panel face and the subpanel surface. Removal of devices shall not require removal of subpanel. Do not mount devices on panel sides.
- C. Wire control devices mounted in control panels through permanently and sequentially labeled terminal strips.
- D. Arrange panels and junction boxes in a clear, logical manner, installed to allow easy servicing and labeling.
- E. Arrange control devices such that inadvertent operation of push buttons, switches, etc. will not result in a jammed or inoperable system caused by component or device failure.
- F. Arrange push buttons in groups according to type of service, such as starting and stopping of fans, remote temperature indication, etc.
- G. Label panels, control switches and panel-mounted gauges with minimum 1/2-inch high by 1/16-inch thick, black, laminated plastic with white core. "Setonply" by Seton Nameplate Corp. or equal. Engrave with 1/4-inch-high characters identifying the switch or gauge by the description indicated on the Control Drawings. Attach labels to panels with mechanical fasteners with a maximum head size of 3/16-inch. Adhesive backing is not sufficient to provide secure mounting.

3.7 SENSORS AND SWITCHES

- A. Mount room sensors and fan control switches so the operable portion are no higher than 48 inches, unless otherwise indicated. Where adjacent to light switches mount at same height as switches to provide a clean horizontally aligned installation unless doing so requires the operable portion to be above 48 inches. Key sensor protection covers identically. Deliver two sets of keys to Owner.
- B. Pump flow or fan flow, etc. shall be sensed using current switch unless indicated otherwise. Calibrate current switch to distinguish between loaded or unloaded motor condition due to belt or coupler breakage.

- C. Differential pressure transducers shall be used to sense differential pressure, unless indicated otherwise. Mount differential pressure transducers in panel adjacent to associated direct digital controller, unless indicated otherwise. At each differential pressure transducer, provide with a differential pressure gauge piped in parallel with the transducer, mounted on panel face.
- D. Connect low temperature limit switches directly to the controlled equipment's motor starter control coil or, for equipment with no motor starter, to contacts of a relay in the equipment's power circuit.
- E. Fill immersion fluid temperature sensor wells with heat conducting compound. At 1-1/2 inches and smaller piping install wells in pipe tees one size larger than line size.
- F. Provide sensors and thermostats installed on exterior surfaces with insulated bases such that actual room temperature, not wall surface temperature, is sensed.
- G. Provide cast aluminum ventilating, non-breakable shields, and mounting brackets for sensors, which are indicated to have protective covers.

3.8 CONTROL POWER SUPPLY

- A. Provide electric power to control devices from stand-by power panel or from device or equipment being controlled.
- B. Provide dedicated breakers and circuits to power direct digital controllers and building management system devices. Carry a dedicated ground wire to controllers from the associated breaker panel. Do not use the conduit system for grounding purposes.

3.9 TESTING AND ADJUSTING

- A. Upon completion of the installation start up the system, perform necessary testing and run diagnostics, and adjust the system to ensure proper operation.
- B. Coordinate the final adjustments and "fine tuning" of control functions and devices so that the building, the mechanical systems, and the control systems operate and respond as an integrated comfortable and energy efficient component of this facility.
- C. Provide a temporary wireless router or hub to allow the portable operator's terminal to communicate to the BMS without a hard wire connection. Locate router to maximize coverage within the facility with the mechanical rooms as the priority. Maintain wireless communication until commissioning is complete or punch lists are complete.

3.10 SPECIAL TOOLS AND SPARE PARTS

- A. Provide one set of special tools required to adjust control devices. This includes multimeters, Allen wrenches, and other special tools. This does not include common tools such as pliers, adjustable wrenches, flat blade or Phillips screwdrivers. This set shall be provided during Owner instruction period and proper use shall be demonstrated to Owner personnel during said period.
- B. Provide 5 spares of each size fuse and 2 spares of each size panel lamp used in the mechanical control system. Spares to be turned over to Owner at time of Owner instruction.

3.11 DATABASE ARCHIVAL AND UPGRADE

- A. Provide a complete database backup CD for the building management system and each direct digital controller to the Owner at final inspection. If software modifications are required during the warranty period, update CD.

3.12 ORIENTATION AND TRAINING

- A. Provide 4 hours of orientation and training to City of Fairbanks personnel designated by the Contracting Officer. Orientation and training sessions shall be conducted by factory-trained manufacturer's representative familiar with the systems software, hardware, and accessories. Complete training and orientation according to the following schedule:
 - 1. 2 hours of instruction after acceptable performance of the system hardware and software has been established prior to final inspection.
 - 2. 2 hours of instruction 6 months after final inspection.
- B. Orientation and training instructions shall consist of hands-on training conducted at the job site during normal working hours. Provide manuals and documentation used in the training sessions.

3.13 FINAL INSPECTION REQUIREMENTS

- A. Final inspection data must be submitted for review, reviewed by the Contracting Officer, corrected in accordance with review comments, and accepted by the Contracting Officer before a request for final or Substantial Completion Inspection will be considered by the Contracting Officer.

- B. Prior to the final inspection, review and test entire installation for conformance with contract documents. Test shall include a point-to-point check verifying connection, calibration, operation and location of each point and a thorough field check of sequence of operations for each system and piece of equipment including simulation of all possible modes of operation. With the call for inspection, verify in writing that this system review and test has been performed and anything not conforming to contract documents shall be so noted.
- C. During inspection, Contractor personnel shall provide assistance to inspection personnel required for a complete and thorough inspection.
- D. During inspection, Contractor personnel shall demonstrate to the owner and owner's engineer that the control system performs in accordance with the contract documents. Provide material and personnel required to perform the demonstration.
- E. Provide minimum 1 week notice to owner and owner's engineer prior to final inspection.

3.14 SEQUENCE OF OPERATIONS

- A. Reference Section 23 09 93 "Control Systems Sequence of Operation" for the control system sequence of operations.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 09 93 - CONTROL SYSTEMS SEQUENCE OF OPERATIONS

- A. This Section of the Specification covers the sequence of operation of the direct digital control and monitoring systems.
- B. General:
 - 1. Provide all physical and virtual points necessary to meet the sequence of operation and alarming indicated.
 - 2. All setpoints shall be programmed to be readily adjustable by authorized users.
 - 3. Program direct digital controllers utilizing room number designations as a base for the controller and sensor names whenever controllers are located within rooms other than mechanical rooms.

1.2 TYPICAL SEQUENCES

- A. Typical occupancy control
 - 1. Building shall be in occupied mode from 7am to 5pm Monday through Friday and in unoccupied mode at all other times and during all City of Fairbanks holidays.
- B. Typical Duplex Pump Lead/Lag Control
 - 1. Alternate lead pump on a monthly basis. Place "A" pump as lead pump during an odd numbered month. Place "B" numbered pump as lead during an even numbered month.
 - 2. Upon call for operation start lead pump and maintain lead pump in operation for a minimum of 1 hour subject to proof of flow.
 - 3. If lead pump flow is not proven after a 1-minute time delay, start lag pump. Initiate critical alarm associated with lead pump after a time delay of 5 minutes and shut down lead pump unless lead pump flow is proven.
 - 4. If lag pump flow is not proven after 1 minute, initiate critical alarm associated with combined lead and lag pump failure. Initiate warning alarm associated with lag pump after a time delay of 5 minutes unless lag pump flow is proven. Run both pumps until manually reset from a building management system workstation.
 - 5. Initiate associated critical alarm if neither pump proves flow after a time delay of 20 minutes.

C. Typical Variable Speed Motor Control

1. Provide an individual minimum speed setpoint, 30 percent of maximum speed, for each motor with variable speed control unless otherwise indicated.
2. Initiate a failure alarm upon a trouble indication from variable speed drive or failure to reach minimum speed setpoint within a 30 second delay period.

1.3 HEATING SYSTEM: HX-1, P-1A, P-1B, CRP-1, GMT-1

A. System Narrative: The hydronic heating system consists of one steam to glycol converter with steam valves arranged for 1/3 - 2/3 operation and variable speed VFD controlled lead/lag heating system pumps. District steam is supplied by Aurora Energy. The heating system is enabled and disabled based on outside air temperature. System supply temperature is also reset based on outside air temperature.

B. Hydronic Circulation Pump Control: P-1A & P-1B

1. Monitor system differential pressure at the location indicated on the drawings
2. Operate heating pumps whenever in heating mode in accordance with the Typical Duplex Pump Lead/Lag Control Sequence.
3. Modulate pump speed to meet system requirements. Modulate pump speed from 30% to the maximum speed determined during balancing to meet system demand as determined by the number of control valves more than 50% open.
 - a. All control valves closed
 - 1) Pump off
 - b. More than 9 control valves 50% or more open, maintain the following reset schedule

Control Valves 50% or More Open	Pump Speed
10	30%
70	Max speed set during balancing

C. Steam Converter Control, HX-1

1. Operate heat exchanger whenever outside air temperature is below 55 degrees F. Provide a deadband of 5 degrees. Modulate steam 1/3 and 2/3 control valves in sequence to maintain the following reset schedule:

Outside Air Temperature	Glycol Supply Temperature
+30 degrees F	120 degrees F
-20 degrees F	180 degrees F

D. Glycol Make-up Tank Control, GMT-1

1. Operate glycol make-up tank through integral controls to maintain hydronic system pressure at 25psi.
2. Monitor tank level through float switch.

E. Condensate Return Pump, CRP-1

1. Operates based on condensate tank level and is automatically activated and pumps are alternated by integral controls.

1.4 TYPICAL ROOM TEMPERATURE CONTROL

A. Typical Space Temperature Setpoint

1. In unoccupied mode all spaces shall have a setpoint of 60 degrees F.
2. Provide user adjustable thermostats in single occupant office spaces with adjustment from 60 degrees F to 75 degrees F.
 - a. The current user adjustable setpoint shall be retained upon reentering occupied mode the following day.
3. Provide non-adjustable thermostats without display in areas other than single occupant office spaces.
 - a. Occupied spaces shall initially be set to 70 degrees f (adjustable)
 - b. Non-occupied spaces such as storage rooms entry vestibules, and mechanical spaces shall be set to 65 degrees F (adjustable).
 - c. Gymnasium 001 temperature shall initially be set to 65 degrees F (adjustable).

- B. Typical Fan Coil Unit control
 - 1. Modulate in sequence and without overlap valve position and fan speed from 0 to 100% to maintain space temperature at setpoint.
 - C. Finned Tube Control
 - 1. Cycle finned tube radiator two position control valve to maintain room temperature at setpoint.
 - D. Unit heater control
 - 1. Cycle unit heater fan to maintain room temperature at setpoint.
- 1.5 DESTRATIFICATION FAN CONTROL VF-1,2,3,4,5,6
- A. Fans shall be controlled by manufacture provided variable speed transformer with no connection to the DDC system
 - 1. Operate fans in "AUTO" function based on the temperature difference between the floor and ceiling
 - 2. Default fan setting shall be "LOW"
- 1.6 CONTROL SYSTEMS ALARMS:
- A. Provide the following maintenance alarms annunciated at the local and remote building management systems.
 - 1. Glycol makeup tank, GMT-1, below 20% full
 - 2. Except for Vestibules, any room temperature 5 degrees F or more below setpoint, following a time delay of one hour delay
 - 3. Glycol Supply Temperature 5 degrees F above or below setpoint for a delay period of 15 minutes. Delay alarm 4 hours on system startup.
 - 4. P-1A loss of flow (as sensed by current sensor)
 - 5. P-1B loss of flow (as sensed by current sensor)
 - 6. CRP-1 high level as sensed by float switch for more than 5 minutes
 - 7. System hydronic pressure below 20 psi

- B. Provide the following critical alarms annunciated at the local and remote building management systems and notification of on call maintenance person.
1. Space temperature below 50 degrees for more than 20 minutes for interior spaces.
 2. Space temperature below 30 degrees for more than 20 minutes in entry vestibules.
 3. Lag heating pump failure.
 4. HX supply temperature above 190 degrees F for more than 2 minutes.
 5. CRP-1 high level activation as sensed by float switch for more than 1 hour

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 21 13 - HYDRONIC PIPING

- A. This Section covers selection, installation, and testing of hydronic heating piping systems and accessories.

1.2 SUBMITTALS

- A. Manufacturer's data, catalog cuts of pipe and fittings are not required.
 - 1. Catalog cuts and selections for equipment and accessory items.
- B. Application Schedule: Submit a schedule of piping and fittings listing the application, product, material, and size proposed for each application.

PART 2 PRODUCTS

2.1 ABOVE GRADE PIPE AND FITTINGS

- A. 2 inches and smaller:
 - 1. Type L hard copper tubing in accordance with ASTM B 42 with wrought copper solder fittings with lead free solder.
 - 2. 3/4-inch and 1-inch branch piping may be connected to copper run piping using mechanically formed tee connections when run piping is minimum 1-1/2 inches and 2 inches respectively.
- B. 2-1/2 inches and larger: ASTM A53 Grade B, Schedule, 40 black steel pipe with butt welded steel joints and fittings.

2.2 HEATING SYSTEM FLUID

- A. 50 percent deionized water/50 percent propylene glycol solution and corrosion inhibitors, as recommended by the glycol manufacturer. Corrosion inhibitors shall be of the phosphate based, pH buffered chemical, non-plating type. Dowfrost HD, ArcticTherm P-50, Hercules Cryo-Tek -100 or equal.
- B. Glycol and corrosion inhibitors shall be packaged by a single manufacturer.
- C. Free initial and annual testing of heating system fluid condition shall be a standard service of the glycol manufacturer.

2.3 HEATING SYSTEM CHEMICAL CLEANING COMPOUND

- A. 1 percent-2 percent Tri-Sodium Phosphate and water solution or equal. Approximately 1 pound per 50 gallons.

2.4 GLYCOL CONCENTRATION TESTING DEVICE

- A. Optical, automatic temperature compensating, high impact vinyl housing. Leica or equal.

PART 3 EXECUTION

3.1 INSTALLATION GENERAL

- A. Install piping level or slightly sloped up in direction of flow.
- B. Provide air vents with isolation at all high points and drain valves at all low points.

3.2 TESTING

- A. Hydrostatically test system at 100 psig for 1 hour with no noticeable pressure drop or water leaks.
- B. Firmly tap soldered fittings with a leather or rubber mallet during the pressure test to demonstrate soundness of soldered joints.

3.3 CLEANING

- A. Drain system and refill and clean system with building domestic water treated with chemical cleaning compound using manufacturer's recommended concentrations.
- B. Clean system by maintaining system temperature at 140 degrees Fahrenheit, operating all pumps with all control valves positioned to full heating, for a period of 8 hours. At Contractor's option room temperature water may be used but circulation time shall be increased to 24 hours.
- C. Flush and drain the system with all strainers cleaned at least twice.

3.4 FILLING

- A. Fill system, including glycol mixing tank to 75 percent full, with heating system fluid utilizing the glycol mixing tank and remove air from system. Check glycol concentration using glycol concentration testing device. Record amount of glycol utilized and final system concentration. At time of instruction of Owner personnel, turn device over to Owner.

3.5 WELDED JOINTS

- A. Unless otherwise indicated provide welds by well-trained and experienced mechanics in accordance with ASME coding and AWS recommended practices.
- B. Provide welding fittings specifically manufactured for this purpose. Weldolets and Thredolets may be used where the tee branch pipe size is less than 2 inches and the main pipe size is 4 inches and larger.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 21 16 - HYDRONIC PIPING SPECIALTIES

- A. This Section covers selection and installation of hydronic heat transfer system specialties.

1.2 SUBMITTALS

- A. Manufacturer's Data:
1. Catalog cuts and selections for equipment and accessory items including:
 - a. Materials of construction.
 - b. Dimensional diagrams.
 2. Performance and capacity data including:
 - a. Capacity under specified conditions.

PART 2 PRODUCTS

2.1 PRESSURE RELIEF VALVES

- A. Relieving capacity equal to heat input rate and setpoint equal to maximum rated working pressure, unless otherwise noted. ASME labeled. Bell & Gossett, Armstrong, Taco, or equal.

2.2 AIR SEPARATORS

- A. Pipe mounted, ASME labeled for 125 psig. Taco 4900 Series, Bell and Gossett model CRSN, Spirotherm Spriovent VDT or equal.
- B. Air elimination verified by third party agency showing unit is effective for removal of micro bubbles and fluid reaches saturation within 100 cycles so that at any cooler downstream location the fluid condition is below saturation so that any free air would be absorbed.
- C. Rated for removal of air to 18 microns and dirt to 35 microns. Provide unit with dirt blow down valve.
- D. Provide with factory welded support tabs where floor support is indicated or for 8 inches or larger air separators.

2.3 DIAPHRAGM EXPANSION TANKS

- A. Precharged and complete with integral heavy-duty butyl rubber diaphragm. Amtrol, Bell & Gossett, Wessels, or equal.
- B. ASME rated and stamped for 125 PSIG working pressure.
- C. Vertical tanks: Equipped with floor mounting skirt.
- D. Equipped with schrader valve charging connection.

2.4 FINNED TUBE RADIATION PIPING EXPANSION COMPENSATORS AND GUIDES

- A. Expansion joint: Sleeved and jacketed expanding bellows design with multi-ply corrugated stainless steel bellows and copper sleeve. Internally guided. Constructed to accept up to 1-inch of expansion and 1/4-inch of contraction. Metraflex HPPF2, Hyspan, Twin City Hose, or equal.
- B. Guide and hanger: Teflon lined guide with compatible hanger constructed to fit within finned tube cabinet and provide concentric guiding. Keflex B guide with BH hanger, Hyspan, Twin City Hose, or equal.

2.5 GLYCOL MIXING TANKS

- A. 55-gallon plastic tank with integral 115V feed pump, with integral check valve, pressure gauge, and pressure switch. Pump rated for 5 to 55 psi. Axiom Model SF100, Wessels, Armstrong, or equal.
- B. Stencil, in minimum 1-inch-high letters, the following label on the glycol mix tank:
REFILL WITH 50/50 PROPYLENE GLYCOL AND DEIONIZED WATER ONLY

PART 3 EXECUTION

3.1 GENERAL

- A. Install as indicated and in accordance with manufacturer's recommendations.
- B. Provide pipe hangers on each side of air separators.
- C. Size supports for expansion tanks assuming that tank will be full of water. At expansion tanks, assume that diaphragm has failed.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 21 23 - HYDRONIC CIRCULATING PUMPS

- A. This Section covers construction, selection, and installation of hydronic circulating pumps.

1.2 SUBMITTALS

- A. Manufacturer's Data:
1. Catalog cuts and selections for equipment and accessory items.
 - a. Materials of construction.
 - b. Dimensional diagrams with equipment clearances.
 - c. Control interface diagrams.
 2. Performance and capacity data including:
 - a. Capacity, head, and brake horsepower under specified conditions.
 - b. Pump curves.
 - c. Pump efficiency.
 - d. Electrical data.

PART 2 PRODUCTS

2.1 GENERAL

- A. Selected to provide capacity and head based on operating conditions and fluid indicated.
- B. Rated for minimum of 230 degrees F, 125 psig service.
- C. Factory operationally tested prior to shipping.
- D. Components compatible with fluid pumped. Provide Viton, Tungsten Carbide, or Silicon Carbide seal for glycol fluids. For water only fluids, provide either the above seals or carbon ceramic seals.
- E. Provide with motors selected to operate within their nameplate amperage (not service factor amperage) at 110 percent design flow.

2.2 IN-LINE PUMPS

- A. When "in-line" pumps are indicated on the Drawings, they may be either "in-line centrifugal" or "in-line system lubricated" as specified below except that "in-line system lubricated" pumps are not acceptable in systems that operate outside the pump manufacturer's recommended operating limits. Grundfos, Bell & Gossett, Taco or equal.
- B. In-line centrifugal pumps:
 - 1. Single stage, integrally mounted, direct drive motor and mechanical shaft seal.
 - 2. Bronze fitted, cast iron unless indicated all bronze or all iron. Provide pump casings with integral suction and discharge gauge tapings.
 - 3. Designed and constructed to allow replacement of all parts except volute casing without disturbing piping connections.
 - 4. Pump impeller: Cast, enclosed type, dynamically and hydraulic balanced. Keyed and locknutted to motor shaft; no couplings between motor and impeller. Provide factory-trimmed impellers with diameter larger than 67 percent of maximum impeller diameter.
 - 5. Seal: Spring-loaded, ring design mechanical shaft seal.
 - 6. Pump shaft shall have stainless steel or bronze sleeve and equipped with slinger ring to protect bearings or motor from minor leakage.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Provide supplementary pipe or pump supports as indicated and as required to prevent overstressing piping or pump casing.
- B. Provide pump connectors at suction and discharge pipe connections to base mounted pumps.
- C. Level, bolt to floor, and realign base mounted pumps and fill pump base with non-shrink grout in accordance with pump manufacturer's recommendations.
- D. Provide P&T plugs where indicated on Drawings for Testing and Balancing.

3.2 OPERATION

- A. Pump motors shall draw less than nameplate amperage (not service factor amperage) when operating driven equipment within both mechanical and electrical design parameters for this Project.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 22 00 - STEAM HEATING PIPING AND SPECIALTIES

- A. This Section covers selection, installation, and testing of steam heating systems and accessories.

1.2 SUBMITTALS

- A. Manufacturer's data, catalog cuts and selections of pipe, joints, fittings, union, nipples, and flanges are not required.
 - 1. Catalog cuts and selections for equipment and accessory items.
- B. Application Schedule: Submit a schedule of pipe, joints, fittings, unions, and flanges listing the application, product, material, and size proposed for each application.

PART 2 PRODUCTS

2.1 PIPE

- A. Steam Piping: Black Carbon Steel, Electric Resistance Welded ASTM A53, Grade B or Seamless ASTM A53, Grade B, or A106 Grade B; Schedule 40.
- B. Condensate Piping: Black Carbon Steel, Electric Resistance Welded ASTM A53, Grade B or Seamless ASTM A53, Grade B, or A106 Grade B; Schedule 80.
- C. Trap Assembly Piping: Black Carbon Steel, Electric Resistance Welded ASTM A53, Grade B, Seamless ASTM A53, Grade B, or A106 Grade B; Schedule 80.

2.2 JOINTS, FITTINGS, UNIONS AND FLANGES

- A. Joints:
 - 1. Piping larger than 2 inches: Butt welded joint, same schedule as adjoining pipe.
 - 2. Welded fittings and flanges: Fabricated from the same material as the pipe.
- B. Fittings:
 - 1. Provide threaded malleable iron fittings, Class 300, on piping 2 inches and smaller conforming to ASME B16.3.

- C. Unions:
1. Provide threaded malleable iron ground joint unions, Class 300, on piping 2 inches and smaller conforming to ASME B16.39.
 2. Provide flanged joint unions on piping larger than 2 inches. Provide gaskets compatible with fluid carried.
- D. Flanges:
1. Piping larger than 2 inches: Forged carbon steel, ASME B16.5, Class 150, weld neck, with raised face.
 2. Piping 2 inches and smaller: Forged carbon steel, ASME B16.5, Class 150, socked-weld End, with raised face.
 3. Provide with manufacturer's trademark affixed in accordance with MSS SP-25.
 4. Flange gaskets: 1/8-inch thick, ASME B16.5, Class 150, ring type, 316 stainless steel inner ring, carbon steel outer ring, 316L stainless steel winding strip, spiral wound with graphite fill. Similar to Flexitallic style CGI with "flexicarb" filler.
 5. Flange Bolt Material:
 - a. Stud Bolts: Alloy Steel, ASTM A193, Grade B7 studs. Provide with ASME B1.1/B18.2.1 thread and Class 2A thread tolerance.
 - b. Heavy Hex Nuts: Alloy Steel, ASTM A194, Grade 8 Nuts. Provide with ASME B1.1/B18.2.1 thread and Class 2B thread tolerance.

2.3 STEAM TRAPS

- A. Steel Systems:
1. Thermodynamic steam traps: All stainless-steel construction, 3.5 psi minimum operating pressure. Rated to 600 psi, 800 degrees F. Complete with integral inlet strainer and blowdown valve, Sarco TD-S-52, Hoffman, Watson McDaniel, or equal. At Contractor's option, trap may be less strainer and blowdown valve provided separate inlet strainer and blowdown valve is provided upstream.
 2. Float and thermostatic traps 1-1/2 inches and smaller: Iron body with all stainless-steel internal components. Mechanical ball float type with thermostatic air vent. Pressure rating and differential pressure suitable for application. Sarco FT Series, Hoffman, Watson McDaniel, or equal.
 3. Float and thermostatic traps 2 inches and larger: Cast Iron body with stainless steel internals or with stainless steel valve and brass valve seat. Mechanical ball float type with thermostatic air vent. Pressure rating and differential pressure suitable for application. Sarco FTB Series, Hoffman, Watson McDaniel, or equal.

2.4 PRESSURE REDUCING VALVES

- A. Cast steel body, stainless steel internals, pilot operated, remote sensing, 250 psi rated. Sarco 25P, Hoffman, Watson McDaniel, or equal.

2.5 VACUUM BREAKERS

- A. All stainless-steel components, 175 psi rated. Sarco VB21, Hoffman, Watson McDaniel, or equal.

2.6 STEAM PRESSURE RELIEF VALVES

- A. Class 250, cast iron body, and stainless-steel trim, fully enclosed spring, adjustable pressure range, and positive shut-off. ASME labeled. Factory set valve to relieve at 10 psi above operating pressure, Sarco SV73 Kunkle, GE Consolidated, or equal.
- B. Provide pressure relief valve with relieving capacity, at setpoint, equal to combined capacity of pressure reducing valves operating at pressure drop indicated.

2.7 MOISTURE SEPARATOR

- A. ASME Code stamped for 300 psig steam service.
- B. Steel Construction, internal baffle, inline piping. Provide with float and thermostatic trap, and flash tank to condensate receiver. Sarco S4A, Hoffman, Watson McDaniel, or equal.

PART 3 EXECUTION

3.1 GENERAL

- A. Run steam and condensate level without sags (dips) or slightly sloped down in direction of flow.
- B. Install drip pockets and steam traps at all low points.

3.2 STEAM TRAP AND PRESSURE REDUCING VALVE INSTALLATION

- A. Provide unions or flanges on both sides of traps and valves.
- B. Install strainers on upstream or inlet side of valves and traps without integral strainers.
- C. Provide dirt legs and blow-off valves with strainers, whether integral or separate.

3.3 STEAM PRESSURE RELIEF VALVE INSTALLATION

- A. Provide piping connections to steam system and accessories as indicated and as recommended by the manufacturer to provide a complete and properly operating system.
- B. Run pressure relief valve vent run full size from relieve valve to exterior of building. Provide ventilated thimble at exterior wall penetration. Terminated vent one foot from building wall with 45 degree beveled end. Piping material and methods as required for steam piping.

3.4 FLASH TANK INSTALLATION

- A. Provide piping connections to steam and condensate systems and accessories as indicated and as recommended by the manufacturer to provide a complete and properly operating system.
- B. Run flash tank vent run full size from flash tank to exterior of building. Provide ventilated thimble at exterior wall penetration. Terminated vent one foot from building wall with 45 degree beveled end. Piping material and methods as required for condensate piping.

3.5 MOISTURE SEPARATOR INSTALLATION

- A. Provide piping connections to steam and condensate systems and accessories as indicated and as recommended by the manufacturer to provide a complete and properly operating system.
- B. Run moisture separator vent run full size with isolation valve from moisture separator to exterior of building. Provide ventilated thimble at exterior wall penetration. Terminated vent one foot from building wall with 45 degree beveled end. Piping material and methods as required for condensate piping.

3.6 STEAM METER

- A. Install in accordance with manufacturer's instructions with a minimum of 10 pipe diameters of straight pipe before and 5 pipe diameters after.
- B. Configure readout to read totalized steam flow in pounds per hour units.

3.7 TESTING

- A. Hydrostatically test new and existing low-pressure systems at 125 psig for 1 hour with no noticeable leaks or pressure drop.

- B. Hydrostatically test new and existing medium and high-pressure systems at 200 psig for one hour with no noticeable leaks or pressure drop.
- C. Report any leaks in the existing system to the Contracting Officer. At the option of the Contracting Officer, they will issue a Contract Amendment to repair leaks or will have Government maintenance personnel repair the leaks.
- D. Testing minor modifications to existing system by returning system to normal operating conditions and visually inspect new joints for leaks.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 37 13 - DIFFUSERS, REGISTERS, AND GRILLES

- A. This Section covers selection and installation of room air distribution devices and outlets.

1.2 SUBMITTALS

- A. Manufacturer's Data:
1. Catalog Cuts and selections for equipment and accessory items.

PART 2 PRODUCTS

2.1 GENERAL

- A. Refer to Drawings for size, type, and capacity.
- B. Construct air outlets and frames from steel or aluminum with eggshell white baked enamel finish, unless otherwise indicated. Clean, phosphatize, and dry all surfaces prior to finishing.
- C. Provide air outlets with frames/borders required to make installation compatible with mounting surface.

2.2 LOUVERED GRILLE/REGISTER

- A. Steel louvers and frame. Single set or double set and adjustable or fixed louvers as indicated. Mount adjustable louvers in friction pivots. Titus 300/350 Series, Anemostat, Kreuger, or equal.
- B. Provide "Heavy Duty Construction" grilles with minimum 14 gauge face bars at 1/2 inch centers and minimum 18 gauge frames.

2.3 LINEAR BAR GRILLE

- A. Fixed, extruded aluminum bars, aluminum finish. Removeable core. Titus CT series, Anemostat, Kreuger, or equal.
- B. Provide opposed blade volume damper when indicated. Screwdriver operator accessible through face.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Coordinate installation with location indicated on architectural Drawings.
- B. Provide edge gaskets and securely fasten all surface mounted flange type diffusers, registers, and grilles to ductwork, sills, or gypsum enclosures. Draw the air devices tight to the finished surface to prevent leakage and smudging.
- C. Outlet installation shall result in no gaps between outlet face or frame and mounting surface.
- D. Where a grille is installed more than 1/2" from the outlet of a fan coil unit, provide ducting to the grille.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 57 16 - SHELL AND TUBE HEAT EXCHANGERS

- A. This Section covers selection and installation of shell and tube heat exchangers.

1.2 SUBMITTALS

- A. Manufacturer's Data:

1. Catalog cuts and selections for equipment and accessory items including:
 - a. Materials of construction.
 - b. Dimensional drawings and details:
 - 1) Dimensions of all components.
 - 2) Connection sizes and locations.
 - 3) Accessory details.
2. Performance and capacity data including:
 - a. Capacity and condensing rate under specified conditions.
 - b. De-rates associated with selection.
 - c. Clean tube factor.
 - d. Fouling allowance.
 - e. Steam pressure.
 - f. Tube heating surface.
 - g. Inlet and outlet water temperatures.
 - h. Fluid type and flow.
 - i. Pressure drop under specified conditions.
 - j. Average fluid velocity.

PART 2 PRODUCTS

2.1 GENERAL

- A. Shell and tube, U-tube removable bundle, internal tube supports and baffles. Bell & Gossett, Amtrol, Armstrong, Dunham-Bush, or equal.
- B. Constructed in accordance with latest ASME Code for unfired pressure vessels, and "U" stamped to indicate conformance with ASME Code, 125 PSI working pressure, shell side and tube side.

2.2 MATERIALS

- A. Shell: Steel.
- B. Tubes: Copper.
- C. Heads: Cast iron or steel.
- D. Tube Sheets: Steel.
- E. Tube Supports and Baffles: Steel.

PART 3 EXECUTION

3.1 GENERAL

- A. Provide unions at each piping connection. Install heat exchanger so that tube bundle can be removed without removal of any piping or equipment except that piping between the tube bundle head and the connecting unions.
- B. Pipe with steam in shell and heated liquid in tubes.
- C. Install at height required for proper condensate drainage.
- D. Provide shell side vacuum breaker.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 82 19 - FAN COIL UNITS

- A. This Section covers selection and installation of room fan coil units.

1.2 SUBMITTALS

- A. Manufacturer's Data:

1. Catalog cuts and selections for equipment and accessory items including:
 - a. Materials of construction.
 - b. Dimensional drawings and details:
 - 1) Dimensions of all components.
 - 2) Connection sizes and locations.
 - 3) Equipment clearances.
 - 4) Piping diagrams.
 - 5) Accessory details.
 - c. Cabinet color selection chart.
 - d. Wiring Diagram.
2. Performance and capacity data including:
 - a. Capacity under specified conditions.
 - b. Fan curves.
 - c. Acoustical data.
 - d. Electrical data including motor efficiency.

PART 2 PRODUCTS

2.1 GENERAL

- A. Manufacturer's standard catalog item that most closely exceeds the design capacity requirements as scheduled on the Drawings with indicated fluids and temperatures. Provide for glycol heating. Jaga Briza or equal.
- B. Provide factory fabricated unit complete with cabinet, coil, fan wheel, fan housing, motor, and power supply.
- C. Coil and cabinet shall have a standard factory warranty of 10 years.
- D. Cabinet
 - 1. Fabricated with 16-gauge galvanized steel and epoxy coated.
 - 2. Front face shall be constructed of a single uniform piece seamless in construction.
 - 3. Fabricated with heat exchanger support bracket.
 - 4. Fabricated without exposed corners or gaps. All corners shall be joined to form one solid piece – gaps are not permitted.
- E. All Valve connections shall be made inside of the cabinet unless separate enclosures are supplied
- F. Coil/Heat Exchanger
 - 1. Corrugated aluminum fins mechanically bonded to copper tubes. Rated for 290-psig working pressure and 200 degrees F inlet fluid temperature.
- G. Fan and housing
 - 1. Electronically Commutated, Brushless DC with ball bearings and provide 100% variable operation
- H. Fan Motor: Electronically Commutated, Brushless DC with ball bearings and 100% variable operation warranted for standard 2 years.

2.2 ACOUSTICAL PERFORMANCE

- A. Units with a high speed output of 350-cfm or less shall always maintain sound noise pressure levels below 36 dBA.
- B. Units larger than 350-cfm shall not exceed a NC-40 on high speed and a NC-30 on low speed. Ratings shall not include room effects.

2.3 CASING

- A. 19-gauge galvanized steel sheet.
- B. Front panel:
 - 1. Removable without special tools for access to all internals.
 - 2. One piece without access doors.

2.4 CABINET FINISH

- A. Baked enamel finish of color selected by Contracting Officer from manufacturer's color selection chart.
- B. All cabinet parts cleaned, bonderized, and phosphatized prior to finishing.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install units to allow access panel to completely open without obstruction.

3.2 OPERATION

- A. Units shall not have any detectable rattles, buzzes, or vibrations. Sheetmetal screws, adhesives, or other fastening devices or techniques shall not be used to correct shipping damage or for field modifications to eliminate rattles, buzzes, or vibrations.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 82 36 - FINNED TUBING RADIATION - COMMERCIAL

- A. This Section covers the selection and installation of commercial grade finned tube radiation.

1.2 SUBMITTALS

A. Manufacturers Data:

1. Catalog data and selections for equipment and accessory items including:
 - a. Provide a separate complete submittal for each finned tube type even though some accessory items may be repeated in several packages.
 - b. Materials of construction.
 - c. Element pipe size, fin size, fin spacing.
 - d. Metal gauges.
 - e. Jointing details.
 - f. Enclosure finish.
 - g. Enclosure color sample selection chart.
 - h. Dimensional drawings and details:
 - 1) Enclosure, support, and brackets.
 - 2) Accessory details.
 - i. Indicate third party performance testing.
2. Performance and capacity data including:
 - a. Output under specified conditions.
 - b. De-rates associated with selection.

PART 2 PRODUCTS

2.1 GENERAL

- A. Provide enclosure, heating element, supports, and accessories of a single manufacturer as a complete package. Rittling, Sterling, Vulcan Radiator or equal.
- B. Output I-B-R rated.
- C. Enclosure heights, depths, and top style are defined by manufacturer and model indicated on the Drawings for each finned tube radiation type.
- D. Finned lengths are indicated on the Drawings. Whenever manufacturer's nominal element length provides less finned length than indicated, provide the next longer nominal length.
- E. Element lengths indicated may not be reduced by utilizing finned elements of a higher nominal capacity.
- F. Indicated pipe or tube size may not be increased on heating systems utilizing a glycol solution.
- G. Material gauges shall be equal to or heavier than that specified hereunder; where material or gauge is not specified, it shall be equal to or heavier than the standard of the manufacturer indicated on the Drawings.

2.2 ENCLOSURES AND TRIM

- A. Fabricated from 16-gauge minimum bonderized steel for enclosures less than 20 inches high and 14-gauge minimum bonderized steel for enclosures 20 inches high and higher unless otherwise indicated.
- B. Baked enamel finish of color selected by Contracting Officer from manufacturer's standard color selection chart.
- C. Provide wall, end, corner, and other trim of the same gauge as enclosure as required to provide a finished product. Terminate covers and fins for radiation that extends from one room to another at the wall dividing the rooms with only piping passing through the wall. Install enclosure wall trim piece at all wall terminations.
- D. Provide key operated hinged access doors at each valve and air vent location.

2.3 NONFERROUS HEATING ELEMENTS

- A. Fabricated from copper tube with mechanically bonded aluminum fins.
- B. Rated for a working pressure 180-psig minimum at 300 degrees Fahrenheit.

2.4 ENCLOSURE TOP SUPPORTS

- A. Fabricated from 20-gauge minimum bonderized steel.
- B. Factory finish to match enclosure on exposed portions.
- C. Formed with a projection on the top to hold the enclosure away from the wall a sufficient distance for easy installation or removal without damaging wall or enclosures.

2.5 ENCLOSURE AND ELEMENT SADDLE SUPPORT BRACKETS

- A. Fabricated from 14-gauge steel and coated with low-friction material to minimize movement noise during warm-up and cool-down.
- B. Designed to constrain the element saddles to positively prevent fin impingement on brackets or enclosure while allowing at least 1-1/4 inches lateral saddle movement.

2.6 ELEMENTS SADDLES

- A. Free moving double saddle type fabricated from heavy gauge bonderized steel. Wire or rod hangers will not be accepted.

PART 3 EXECUTION

3.1 INSTALLATION

- A. General:
 - 1. Install enclosures, elements, and supports in accordance with manufacturer's instructions, and as indicated.
 - 2. Paint wall covered by enclosure flat black. See Division 9.
- B. Enclosure Top Supports:
 - 1. Continuous for the length of the enclosure.
 - 2. Firmly anchored to the wall with screws at every wall stud crossed.
- C. Enclosures and Trim:
 - 1. Install enclosures wall-to-wall or, when not indicated wall-to-wall, of length required to totally encompass indicated element lengths and accessories. Install non wall-to-wall enclosures tight to end wall, centered under window, or centered on wall as indicated.

2. Install enclosures with tops level, with joints tightly butted, and at mounting heights indicated with manufacturer's recommended as minimum.
 3. Install trim specifically recommended by manufacturer for application. Install trim square with enclosure.
 4. Where control element of self-contained control valve is mounted on enclosure, set element square with enclosure and conceal sensing bulb within enclosure.
 5. Provide plastic chrome plated plumbing fixture tailpiece to conceal exposed hydronic piping penetrating floor.
- D. Enclosure and Element Saddle Support Brackets:
1. Space not over 4 feet on center. Provide bracket within 2 feet of each end of enclosure. Provide additional brackets when required to support enclosure accessories.
 2. Firmly attach to enclosure with concealed screw or spring clip type fasteners. Friction type fasteners will not be allowed.
 3. Securely fastened with screws to wall studs at the top and bottom.
- E. Elements:
1. Install so that fins do not impinge on brackets or enclosures. Trimming fins will not be accepted.
 2. Install flat or pitched up to one-half inch per ten feet in direction of flow.
 3. Install eccentric reducers with top flat on joints between different size element and heating water return piping. Supply connections may utilize concentric reducers.
 4. Elements shall be clean and free of paint.

3.2 FINISHES

- A. Touch up all damaged spots and holidays with manufacturer supplied touch-up enamel.
- B. Provide the Owner with at least two unopened 1/2-pint cans of touch-up enamel from the same batch as the original factory-finish batch when final finish is from manufacturer's standard color selection chart.
- C. All enclosures and trim within same room shall be of the same shade and present an identical appearance irrespective of viewing angle.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 82 39 - UNIT HEATERS

- A. This Section covers selection and installation of hydronic unit heaters.

1.2 SUBMITTALS

- A. Manufacturer's Data:

1. Provide a separate complete submittal for each unit even though some accessory items may be repeated in several packages.
2. Catalog data and selections for equipment and accessory items.
3. Selection with drawings and details indicating dimensions and compliance with capacity/condition requirements indicated.
4. Coil Data.
5. Fan data indicating capacity.
6. Wiring diagram.
7. Electrical data.

- B. Sample: Enclosure finish and color.

PART 2 PRODUCTS

2.1 FIXED DISCHARGE UNIT HEATERS

- A. Manufacturer's standard catalog item which most closely exceeds the design requirements indicated with fluid indicated. Trane , Modine, Beacon Morris, or equal.
- B. Casing:
1. Horizontal projection units: Two-piece with "picture frame" front formed into wrap around sides, top, and bottom. 20-gauge back panel.
 2. Phosphatized to prevent corrosion and finished with manufacturer's standard color baked enamel unless otherwise indicated.

- C. Coil:
 - 1. Aluminum fins mechanically bonded to seamless copper tubes.
 - 2. Rated working pressure: Steam, 75-psig. Hot water, 225-psig.
 - 3. Tested under water at 250-psig.
- D. Fan and Motor:
 - 1. Direct drive propeller type, factory balanced fan with aluminum blades.
 - 2. Totally enclosed, permanently lubricated motor with integral overload protection.
 - 3. Provide motors 1/6 horsepower and larger with ball bearings.
- E. Discharge:
 - 1. Louvered discharge on horizontal projection units.

2.2 VIBRATION ISOLATORS

- A. Steel spring and 0.3-inch deflection neoprene element in series. Mason Industries Type 30 or equal.
- B. Spring: Minimum additional travel to solid equal to 50 percent of the rated deflection.
- C. Neoprene element: Molded with a rod isolation bushing that passes through the hanger box.
- D. Spring diameters and hanger box lower hole sized large enough to permit the hanger rod to swing through a 30 degree arc before contacting the hole and short-circuiting the spring.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Provide flex connections at supply and return piping connections to units with motors 1/4 horsepower and larger.
- B. Provide vibration isolators at supports for units with motors 3/4 horsepower and larger.

3.2 OPERATION

- A. Units shall not have any detectable rattles, buzzes, or vibration. Sheet metal screws, adhesives, or other fastening devices or techniques shall not be used to correct shipping damage or for field modifications to eliminate rattles, buzzes, or vibrations.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 23 82 43 - CABINET UNIT HEATERS

- A. This Section covers selection and installation of cabinet unit heaters.

1.2 SUBMITTALS

- A. Manufacturer's Data:

1. Provide a separate complete submittal for each unit even though some accessory items may be repeated in several packages.
2. Catalog data and selections for equipment and accessory items.
3. Selection with drawings and details indicating dimensions and compliance with capacity/condition requirements indicated.
4. Fan data indicating capacity.
5. Coil Data.
6. Filter Data.
7. Acoustical Data.
8. Wiring diagram.
9. Electrical data.

- B. Sample: Enclosure finish and color.

PART 2 PRODUCTS

2.1 GENERAL

- A. Manufacturer's standard catalog item that most closely exceeds the design capacity requirements as scheduled on the Drawings with indicated fluids and temperatures. Trane, Beacon Morris, Rittling, or equal.
- B. Provide factory fabricated unit complete with cabinet, chassis, coil, filter, fan wheel, fan housing, motor, and controls.

- C. Filter: 1-inch pleated media. Average ASHRAE Standard 52-76 efficiency: 20 percent with 85 percent arrestance.
- D. Coil: Aluminum fins mechanically bonded to copper tubes. Rated for 300-psig working pressure and 200 degrees Fahrenheit inlet fluid temperature. Factory leaked tested under water at 100-psig.
- E. Fan and housing: Centrifugal forward-curved, double width, aluminum fan wheel. Formed sheet metal housing with corrosion resistant finish.
- F. Vibration isolation: Rubber-in-shear supporting fan and motor.

2.2 ACOUSTICAL PERFORMANCE

- A. Units with a high-speed output of 600-cfm or less shall not exceed a NC-50 on high speed and a NC-40 on low speed. Ratings shall not include room effects.
- B. Units larger than 600-cfm shall not exceed a NC-55 on high speed and a NC-45 on low speed. Ratings shall not include room effects.

2.3 VERTICAL UNITS

- A. 18-gauge galvanized structural steel chassis.
- B. 16-gauge galvanized steel front panel and 18-gauge galvanized steel end and top panels.
- C. Front panel:
 - 1. Removable without special tools for access to all internals.
 - 2. One piece without access doors.
 - 3. Insulated at coil section.
- D. Inverted flow unless otherwise indicated. Inlet and outlets grills stamped into front panel.

2.4 CABINET FINISH

- A. Baked enamel finish of color selected by Contracting Officer from manufacturer's standard color selection chart.
- B. All cabinet parts cleaned, bonderized, and phosphatized prior to finishing.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install units to allow access panel to completely open without obstruction.

3.2 OPERATION

- A. Units shall not have any detectable rattles, buzzes, or vibration. Sheetmetal screws, adhesives, or other fastening devices or techniques shall not be used to correct shipping damage or for field modifications to eliminate rattles, buzzes, or vibrations.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 26 05 50 - BASIC MATERIALS AND METHODS

- A. This Section covers general electrical requirements for Work covered under this Division.
- B. All Work and Services specifically covered under this Division is supplementary to that covered under other Divisions of these Contract Documents. The requirements of this Division, which are more stringent than that covered under other parts of these Contract Documents, apply to the Work covered under this Division.
- C. All incidental Work required but not specified under this Division shall comply with the Division in which it is specified.
- D. Review the Drawings and Specifications of all other Divisions for additional Work under Division 26.

1.2 GENERAL REQUIREMENTS

- A. Provide all work as shown on the drawings and in these specifications for a complete, safe, and functional installation. All work shall comply with the latest edition of the National Electrical Code (NEC).
- B. The Contractor is responsible for providing complete and operating systems in the facility. The intention of the Contract Documents is to include all labor and materials, equipment, and transportation necessary or reasonably inferable as being necessary for the execution of the work. Where minor adjustments of the work are necessary for purposes of fabrication or installation of items, or resolution of conflicts between items within the intent of the Contract Documents, the Contractor shall make such adjustments at no added expense to the Owner. Where such adjustments affect functional or aesthetic design of the work, they shall first be submitted to the Owner's Representative for review and approval.
- C. Obtain and pay for all permits, plan reviews and inspections required for the work covered by this Division of the Specifications.
- D. Unless otherwise noted, all materials shall be of new manufacture, and installed before expiration of their shelf life, if applicable.
- E. Materials and equipment are to be those of major and reputable manufacturers with ability to render competent and thorough service through local and regional organizations capable of expeditiously providing service, parts and assistance.
- F. Materials of similar nature, style, function, purpose and/or appearance shall be like products from the standard product line of the same manufacturer.

- G. All products shall be listed and labeled by an approved national testing laboratory for their intended use and location in all cases where such products are listed and labeled. Where no product listed by an approved national testing laboratory for the application is available, provide certification of performance, function and rating from an independent testing agency or laboratory approved by the Owner.
- H. Verification is required of all equipment sizes and locations prior to the ordering or installation of connection materials and disconnecting equipment to ensure that the power connections are of the proper size and type, and in the proper location. Verify all electrical loads (voltage, phase, full load amperes, number and point of connections, minimum circuit ampacity, etc.) for equipment furnished under all divisions of this specification, by reviewing respective shop drawings furnished under each division. Meet with each subcontractor furnishing equipment requiring electrical service and review electrical characteristics. Report any variances from electrical characteristics noted on the drawings with the Owner before proceeding with rough work. Obtain and review the equipment shop drawings to determine particular final connection requirements before rough-in begins for each equipment item.
- I. The omission of express reference to any parts, supplies, services, or facilities necessary for, or incidental to, a complete installation shall not be construed as a release from furnishing such items.
- J. All materials shall be installed in a neat, orderly, and secure fashion, as required by these specifications and commonly recognized standards of good workmanship. The norms for execution of the work shall be in conformity with NEC Chapter 3 and the National Electrical Contractors' Association "National Electrical Installation Standards", for which the Owner's judgment shall be final.
- K. Electrical equipment shall be installed in spaces that are accessible and in a manner that allows for maintenance and replacement. Entries into spaces shall allow for the passage of equipment. Coordinate the final locations with piping, ducts, and equipment of other trades to ensure proper access for all trades. Coordinate location of concealed equipment, disconnects and boxes with access panels and doors.

1.3 DRAWINGS

- A. Unless otherwise indicated, drawing symbols conform to the applicable standards of ANSI. The Drawings (or Contract Drawings) rely heavily upon symbolic representation of the features shown, and represent exact details only so far as indicated.
 - 1. The Drawings are, to some extent, diagrammatic and are not intended to show exact details.

2. Dimensions scaled from the Drawings may vary due to tracing tolerances, printing distortion, field conditions, field changes, and other factors. For these reasons, it shall be the Contractor's responsibility to field verify dimensions that pertain to his work. The Contractor shall make minor relocations where necessary to resolve conflicts or present a uniform appearance. The drawings show the exact location of electrical features only where specifically dimensioned.
3. The Electrical Contractor shall review the Contract Documents of the other trades on the Project and shall coordinate the installation of electrical features with the work of all other trades.
4. Provide fixtures, devices, equipment, conduit, conductors, and accessories indicated on the Drawings unless it is specifically indicated that the fixture, device, equipment, conduit, conductor, or accessory exists.

1.4 REPAIR OF EXISTING FEATURES

- A. Where existing or previously completed building surfaces or other features must be cut, penetrated or otherwise altered for the installation of electrical features, such work shall be carefully laid out and performed, and any subsequent patching or repairs that it necessitates shall be performed by skilled mechanics of the trades involved.

1.5 REMOVAL OF EXISTING FEATURES

- A. Where connected to or serving fixtures or equipment being removed, or incidental to the required removal of walls, ceilings, or other features, existing electrical features shall be removed as follows:
 1. All abandoned wiring shall be removed back to its source of supply.
 2. Exposed items shall be removed in their entirety.
 - a. All abandoned exposed conduit, including all abandoned conduit above accessible ceiling finishes shall be removed back to the source of supply, or back to the connection to a still active branch. Cap and properly close all openings in remaining conduits, boxes and enclosures.
 3. Concealed items such as raceways and boxes may be abandoned in place if they are completely concealed by the new construction and all conductors are removed or cut back so as to not be re-connectable to any source of power. Provide blank device plates or blank covers in all unused outlet boxes.
 - a. Conduits concealed in areas not accessible or that are not being made accessible shall be removed into areas of non-accessibility. Patch to match existing, openings in walls, ceilings, or floors left or created as a result of conduit removal.

- b. Conduits that are being removed and that extend below slab on grade shall be ground flush with the top of the slab, plugged with concrete, and the slab patched to match existing.
4. Where other electrical items are fed through, supported by or attached to a removed item, re-route raceways and/or cut back building surfaces as necessary to rejoin raceways, provide new conductors as necessary, and patch and finish all damaged construction to match surrounding surfaces.
5. Salvage or disposal of removed items shall be as noted on the Drawings and/or as directed by the Owner.

1.6 FIRESTOPPING

- A. Where electrical raceways or other features penetrate fire-rated building surfaces, they shall be securely sealed to the surrounding surface with 3M Fire Barrier Caulk No. CP25, Fire Barrier Putty No. 303, intumescent coatings as elsewhere described in these Specifications for the general construction, or other equal.

1.7 PROTECTION OR CLEANING

- A. All electrical equipment shall, during the entire duration of construction work, be protected against water, dust, debris, overspray or any other contamination, whether environmental in origin or as a result of construction work.
- B. All construction dust, debris, overspray, scrap and surplus materials, etc. resulting from this work shall be cleared away, leaving the installation in completely clean condition.

1.8 SUBMITTALS

- A. These materials for this project are mainly considered commodity items, conduits, conductors, receptacles and other non-specialized electrical equipment. As such the contractor has the option to provide submittals for items which they would want to be reviewed but is not specifically required to do such per this specification.

PART 2 PRODUCTS

2.1 RACEWAYS

- A. Minimum size for all raceways shall be 1/2-inch diameter. Minimum size of conduit for homeruns shall be 3/4-inch diameter.
- B. Raceways shall be of types and characteristics recognized by the NEC.

C. Materials:

1. Rigid Steel Conduit shall be hot-dip galvanized, Schedule 40 Dimensions with smooth interior. Acceptable manufacturers include but are not limited to the following: Allied Tube & Conduit, J & L, Triangle, Western Tube & Conduit, Youngstown, or equal.
2. Rigid Steel Conduit shall be made up with threaded fittings only.
3. Electrical Metallic Tubing shall be hot-dip galvanized, with smooth interior; Allied Tube & Conduit, J & L, Triangle, Youngstown, or equal
 - a. EMT shall be made up with concrete-tight compression fittings. Provide rain-tight compression EMT fittings for exterior locations. Connectors shall have insulated throats.
4. Intermediate Metal Conduit shall be hot-dip galvanized steel, with smooth interior. Acceptable manufacturers include but are not limited to the following: Allied Tube & Conduit, Cyprus, Western Tube & Conduit, or equal.
 - a. IMC shall be made up with threaded fittings only.
5. Flexible Metal Conduit ("flex") shall be Greenfield type, made of interlocking galvanized steel armor; Alflex, American Metal, Carol Cable Co., Electri-flex, National Electric, RACO, Thomas & Betts, Triangle, or equal.
6. Liquid-tight Flexible Metal Conduit ("sealtite" flex or "LT flex") shall have a flexible galvanized steel spiral core with a flexible outer jacket of PVC, resistant to water, oil, grease, corrosive agents, and abrasion; Carol, Anaconda, or equal.
 - a. Fittings for liquid-tight flexible conduit shall be steel or malleable iron of a type incorporating a threaded grounding cone, nylon or plastic compression ring, and a tightening gland, providing a low resistance ground connection. All throats shall be insulated.
 - b. Exterior or other extreme temperature applications of Liquid Flexible Metal Conduit shall have temperature rating of minus 67 degrees F to plus 220 degrees F, Liguatite "ATLA", or equal.
7. Surface Metal Raceways shall be installed complete with the manufacturer's standard hardware appropriate to the installation. Surface metal raceways shall be steel, one-piece design with a base and cover factory assembled. The raceway shall have minimum dimensions of 0.50-inch wide by 0.34-inch deep unless other sizes and styles are noted on the drawings or specified in other sections of these Specifications.

2.2 WIRES AND CABLES

- A. Provide 600-volt building wire and cable as shown on the drawings and further specified herein. All wire and cable shall conform to the latest specifications of the NEC and/or the ICEA and shall be the products of American Insulated Wire, BICC General, Carol Cable, Excel Wire & Cable, Okonite, Southwire, Superior Essex, or equal.
- B. Conductors: All conductors shall be copper, except as otherwise noted. Conductors No. 10 AWG and smaller shall be solid. Conductors No. 8 AWG or larger shall be stranded.
- C. Insulation Types:
 - 1. Branch circuit conductors will consist of conductors run in conduit and raceways.
 - a. Branch circuit conductors in raceways shall be 600-volt insulated, and unless otherwise noted on the drawings, shall have the following insulation types:
 - 1) Heated indoor spaces - THHN/THWN or XHHW.
 - 2) In conduit, outdoors or other cold locations (such as attics) - XHHW.
 - 2. Feeder conductors shall have type XHHW insulation.
 - 3. Special applications: Conductors in fluorescent fixture wiring channels shall have 90 degrees C insulation rating, types THHN, XHHW, or equal. Conductors in high temperature locations shall have one of the high temperature insulation types suitable for the use and as permitted by the NEC.
 - 4. Nylon-jacketed conductors such as types THHN or THWN shall not be used in any location subjected to ambient temperatures below 32 degrees F.

2.3 OUTLET BOXES

- A. Boxes shall be deep-type (2-1/8-inch nominal) unless space limitations or drawing notes require shallower boxes.
 - 1. Fixture outlet boxes for use with concealed raceway systems shall be 4-inch octagonal or square, galvanized sheet Steel.
 - 2. Boxes for other wall-mounted devices with concealed raceways shall be galvanized sheet Steel, 4 inches square for up to two devices, and solid ganged boxes for more than two devices.

2.4 WIRING DEVICES AND PLATES

A. Receptacles:

1. Single and duplex receptacles shall be Extra Heavy Duty grade, nylon faced, ivory-color, self-grounding, 120-volt, 20 amp, 3-wire, NEMA 5-20R configuration, with screw terminals.
2. Special purpose receptacles shall be Specification grade, with the NEMA configuration noted on the drawings. A matching plug shall be furnished for every special receptacle.
3. Weatherproof covers shall have a full width hinged cover suitable for receptacles installed in wet locations to maintain the integrity of the receptacle when the attachment plug is inserted. Covers shall be constructed of die cast aluminum, for duplex receptacles, drilled for four screw holes for horizontal.
4. GFCI receptacles shall be of NEMA 5-20R configuration, for single-strap mounting, with "test" and "reset" buttons accessible from front. Ground fault trip level shall be 5mA, and the trip circuitry shall be essentially immune to nuisance tripping due to spurious influences such as RF noise. Feedthrough terminals shall be provided for protection of downstream outlets.

B. Plates:

1. Cover plates for devices in surface-mounted boxes shall be of pressed or machined metal construction, specifically designed to suit the boxes.

C. Terminals

1. Wiring devices shall have binding-screw type terminals only. Terminals using spring pressure to secure the wire and make electrical contact are not permitted.

D. Manufacturers

1. Among the acceptable wiring devices and plates are the products of Arrow-Hart, Bryant, Hubbell, Leviton, Pass & Seymour, or equal.

2.5 DISCONNECT SWITCHES

A. Unless otherwise noted, disconnect switches shall have the following features:

1. The proper NEMA enclosure to suit the location, or as noted on the Drawings. The proper voltage rating to suit the circuit voltage.
2. Quick-make/quick-break mechanisms with visible blades (when the cover is open), to disconnect all ungrounded conductors.

3. Switch handle positions shall be marked to indicate the ON and OFF conditions, and the handles shall be pad-lockable in the OFF position. Covers shall be interlocked with the handles to prevent cover opening while switch is ON, and a means shall be provided to permit qualified personnel to defeat this feature.
 4. Disconnects shall be fusible, heavy-duty switches, unless otherwise noted. Where disconnects are not readily accessible, they shall be of the non-fusible type, and fusible protection for the circuit shall be provided in an accessible location.
 5. Motor disconnects shall be sized according to their standard, not maximum, ratings.
 6. Where separate control voltages are supplied to motor controllers, the disconnect switch shall simultaneously disconnect the control circuit(s) with the power circuit(s).
- B. Among the acceptable disconnects are the products of Square D, Eaton Cutler Hamer, Siemens, or equal.

2.6 MOTOR START SWITCHES

- A. Motor start switches shall be Square D Class 2510 or equal, with red pilot light, resettable overload protection, and toggle handle with guard/lockoff hasp.
- B. Of the correct voltage rating for the system on which they are installed, with NEMA size and number of poles as shown on the drawings.

2.7 OVERCURRENT PROTECTION DEVICES

- A. Fuses:
1. Fuses shall be Bussman, Reliance, Shawmut, or approved equal, of the correct voltage rating for the circuit where used, and the following types unless otherwise noted:
 2. In motor disconnect switches: UL Class K-5, dual-element time-delay type, sized to suit the motor nameplate full load current in accordance with the manufacturer's recommendations for overload and single-phasing protection.
- B. Circuit Breakers:
1. Unless otherwise noted, circuit breakers shall be of the molded-case thermal-magnetic type, with the following features:
 - a. Size, number of poles, and interrupting capacity as shown on the drawings. Ampere ratings shall be clearly visible, even when the breaker is installed in its appropriate enclosure.

- b. Voltage rating to suit the voltage of the system on which they are used.
- c. Each breaker pole shall provide both instantaneous and inverse-time tripping, with tripping clearly indicated, and a common-tripping tie to any other poles in the same breaker. Handle-ties are not acceptable for this purpose.
- d. Breakers shall be operated by a toggle handle and shall have a quick-make, quick-break, over center switching mechanism that includes a trip-free feature so that the contacts cannot be held closed against tripping currents.
- e. Circuit breakers shall be labeled or listed by an independent testing laboratory and shall conform to the latest NEMA Standards and the short-circuit test parameters of NEMA Publication AB 1.
- f. Circuit breakers shall not use solid-state components for any function except ground-fault tripping.

2.8 GROUNDING

- A. All metal raceways, enclosures, other electrical equipment and non-electrical equipment such as tanks and dispenser platforms that may pick up harmful potentials from the electrical system, shall be securely bonded and grounded as required by the NEC and the drawings.
- B. All grounding conductors and bonding jumpers shall be copper, sized according to the NEC or as noted on the Drawings.

PART 3 EXECUTION

3.1 IDENTIFICATION OF ELECTRICAL EQUIPMENT

- A. Panelboards, disconnect switches, pushbuttons, selector switches, distribution gear and circuit breakers in the distribution gear, and the like shall be labeled with laminated plastic labels engraved with white letters on black background. Lettering shall be block style, 1/4-inch tall, except where space limitations, drawing notes, or other requirements in these Specifications dictate otherwise. Labels shall be secured with pop rivets or screws. Adhesive attachment is not acceptable.
- B. Provide new updated typed circuit directories for all panelboards affected by the Work of this project. Each entry shall accurately and uniquely identify the specific purpose of the connected load of the circuit from all others in the same panelboard (i.e., Lighting, Receptacles, Mechanical Equipment, etc.) in accordance with NEC 408.4. The circuit directory shall be installed on the inside cover of each panelboard.

- C. Terminals on strips shall be numbered with indelible markings on special strips designed for the purpose, and a diagram or typed directory shall be provided in the terminal enclosure to identify the origin, function and destination of each conductor in the enclosure.
- D. All conductors in pull or junction boxes or other enclosures shall be permanently and legibly tagged or labeled with panel and circuit numbers or other data, which clearly identifies their origin, function, and destination.

3.2 RACEWAYS

- A. All conductors shall be installed in metal raceways, or as otherwise noted on the drawings and/or specified herein.
- B. Branch Raceways - Unless otherwise shown, raceways concealed in non-concrete walls or above suspended ceilings shall be Electrical Metallic Tubing (EMT). Exposed raceways shall be surface metal raceway in finished areas, Electrical Metallic Tubing (EMT) in all other spaces.
- C. Exposed raceways shall be run square with the building lines. Concealed raceways may be run in direct lines where practical.
- D. The final connection to any motor or other rotating or vibrating equipment, or equipment which may require position adjustment after installation, shall be made through a slack section of flexible liquid-tight metal conduit 18 inches to 36 inches long. For such connections to pump motors, and to equipment in damp, wet, or exterior locations or in Mechanical Rooms, the flex shall be of the oil-resistant liquid-tight type.
- E. Structural members shall not be cut, drilled, or notched for raceways or other electrical features unless specifically accepted by the Owner.
- F. All raceways running from a warm area to a cold area shall be securely sealed inside the warm end with duct seal, a silicone compound not harmful to the wire insulation, or equal. Use seal off fittings at panels if the feeder conduit enters the top of the panel and is run so as to expose it to different temperatures, such as through attic spaces.
- G. Maintain a minimum 6-inch clearance between conduit and piping. Maintain 12-inch clearance between conduit and heat sources such as flues, steam pipes, heating pipes, and heating appliances.
- H. Raceways shall be installed in switchboards, panelboards, gutters, pull boxes and the like from the back of the enclosure closest to the mounting surface, to the front in a manner that will not obstruct the future installation of raceways.

- I. Raceways shall be physically and electrically continuous from enclosure to enclosure. Electrical continuity for conduits shall be assured by inclusion of an NEC-sized grounding conductor. For metallic conduits, it shall also be assured by making up all joints wrench-tight and free of foreign materials. Threaded conduits shall enter enclosures by means of threaded hubs or double-locknut-and bushing connections. For conduits of one inch trade size and larger, bushings shall be of the insulated type.
- J. Conduit joints shall be cut square, reamed smooth, and cleaned of burrs, cutting oil, cuttings, and other foreign materials prior to assembly. Ends shall be capped to prevent entrance of foreign materials during construction.
- K. Bends, offsets, and saddles shall be made with factory elbows and fittings, or field-made with approved benders, to not less than NEC-required radii.

3.3 WIRING AND CABLES

- A. Branch circuit conductors shall be color-coded by factory pigmentation of the insulation. Larger conductors may be color-coded by wrapping the ends with colored tape in all enclosures, except that white and green conductors may never be phase-taped for any use other than neutral and ground, respectively.
- B. Conductors No. 6 AWG and smaller shall be color-coded by factory pigmentation of the insulation. Larger conductors may be color-coded by wrapping the ends with colored tape in all enclosures, except that white (or gray) and green conductors may never be phase-taped for any use other than neutral and ground, respectively.
- C. Color-coding throughout the entire installation shall be as follows:

SYSTEM VOLTAGE	
<u>Conductor</u>	<u>208Y/120</u>
Phase A	Black
Phase B	Red
Phase C	Blue
Neutral	White
Ground	Green

- D. Branch circuit conductors shall be No. 12 AWG copper, except for the following:
 - 1. Homeruns longer than 70 feet from a 208Y/120-volt panelboard shall not be less than No. 10 AWG conductors.

2. Where branch circuit conductor sizes are indicated on the drawings, they shall take precedence over the foregoing. Where field conditions dictate circuit routings that increase conductor lengths beyond what would be expected from the layout shown on the drawings, they shall be submitted to the Project Manager for acceptance.
 3. Where conductor wire is larger than #12 AWG, contractor shall use wiring lugs to connect to wiring devices.
- E. Common neutrals are not permitted for single phase branch circuits unless otherwise noted on the Drawings.
 - F. All conductor connections shall be made up securely with solderless pressure connectors such as setscrew lugs, split-bolts, wirenuts, "wingnuts", or suitable crimp fittings. Live-spring connectors which cannot be tightened to a point where conductor deformation occurs (such as "Scotchlocks") are not permitted. Each wirenut-type connector shall not contain more than (4) conductors, regardless of size.
 - G. Use compression type connectors for copper wire splices and taps, #6 AWG and larger. Utilize heat shrink tubing of the proper voltage rating for uninsulated conductors and connectors.
 - H. Thoroughly clean wires before installing lugs and connectors.
 - I. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.
 - J. Terminate spare conductors with wire nuts.
 - K. Where stranded conductors #14 AWG and smaller are used, their ends shall be twisted and "tinned" with solder prior to connection, or else terminated with crimp-on connectors (T & B Sta-Kon, or equal), set screw lugs, box lugs, or self-lifting pressure terminals.
 - L. Flexible cords shall be connected to equipment, fixtures, boxes, or other enclosures only by means of cord-grip bodies or other strain-relief fittings specifically designed for the purpose. NM cable clamps are not permitted for this use.
 - M. Where conductors or their connectors are to be connected to metal surfaces, the surface shall first be scraped free of any paint, oxide, or other non-conductive substances. Where there is a possibility of corrosion due to moisture or other cause, a conductive corrosion inhibitor shall be used between the conductor and the metal surface.
 - N. Conductors shall be pulled into raceways only by constant-tension pulling methods. Where necessary, wire-pulling lubricants of a type that is not harmful to conductor insulation and will not harden shall be used.
 - O. Completely and thoroughly swab raceway system before installing conductors.

- P. Neatly train and lace wiring inside boxes, equipment and panelboards.
- Q. All conductors shall be protected from damage. Where the conductor or insulation is damaged, the Owner may require, at no cost to the Owner, the replacement of the entire conductor, or the implementation of an approved repair method approved by the Owner.

3.4 MOTOR STARTER INSTALLATION

- A. Provide overload setting correlated with full load current, NEMA code letter and service factor reflected on actual nameplate of each furnished motor.
- B. After final connections are made, check and correct the rotation of all motors.
- C. Provide engraved nameplates for all units clearly identifying the equipment served.
- D. Do not mount starters on vibrating equipment. Fasten securely to supporting structure at walls and mounting stands.
- E. Motor Data: Provide neatly typed label inside each motor starter enclosure door identifying motor served, nameplate horsepower, full load amperage, code letter, service factor, voltage/phase rating, and the final settings of overload devices.

3.5 DISCONNECT SWITCH INSTALLATION

- A. Install disconnect switches in accessible locations within sight of the equipment they control for all equipment as indicated on the Drawings.
- B. Install fuses in fusible disconnect switches.
- C. Provide a label on inside door of each switch indicating UL fuse class and size for replacement.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 26 24 18 - BRANCH CIRCUIT PANELBOARDS

- A. Provide branch circuit panelboards as shown on the contract drawings and further specified herein.

1.2 SUBMITTALS

- A. Submit manufacturer's product data and specifications for equipment and component devices.
- B. Include outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker arrangement and sizes.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Acceptable manufacturers for branch circuit panelboards shall be Square D, Cutler-Hammer, Siemens, or equal.

2.2 BRANCH CIRCUIT PANELBOARDS

- A. Branch panelboards shall be of the bolt-on circuit breaker type, with the following features:
 - 1. Flush or surface mounted, as shown on the Drawings. Flush-mounted panelboards may be furnished with prime coat finish only, for jobsite finish painting. Surface-mounted panelboards shall be furnished with the factory standard paint finish.
 - 2. Panelboard fronts shall not contain any visible screws or other fasteners. Fasteners which are designed to be wedged in place by sliding sideways with a screwdriver are specifically prohibited. Fronts shall have a lip or bracket which rests on the bottom return flange of the panel enclosure, to permit the front to be held in place with one hand while fastening. Each front shall have a hinged door with a locking latch, furnished with two keys. All locks shall be keyed alike.
 - 3. Panelboards shall have main lugs only, unless a main circuit breaker, through-feed lugs, or subfeed lugs are noted. Lugs shall be sized to accommodate the feeder conductors shown on the Drawings.

4. Current rating of the main buses shall be as noted on the Drawings. Where a main circuit breaker size does not correspond to a factory standard bus size, the next larger standard size main buses shall be used. All bus components shall be braced to withstand fault currents of the peak magnitude corresponding to the branch circuit breaker interrupting ratings shown on the Drawings. Panelboards shall be bussed full height (including bus fingers and related hardware), to allow all available branch circuit spaces to be used.
5. Cabinets shall be nominally 20 inches wide, 5-3/4 inches deep.
6. An adequate ground bus shall be provided for all branch circuit equipment grounding conductors shown on the drawings, plus 20 percent spare.
7. Unless otherwise noted, multi-section panelboards shall have equal quantity of circuit positions in each section, and equal size enclosures for each section.

2.3 BRANCH CIRCUIT BREAKERS

- A. Panelboards shall be furnished with bolt-on branch circuit breakers conforming to Section 26 28 16, in the quantity, size, number of poles, and interrupting ratings shown on the panel schedule(s). Branch circuit breakers shall be installed in the exact circuit positions shown on the panel schedule(s), unless otherwise accepted by the Owner.
- B. Where GFI breakers are called for, they shall have a ground fault current trip level of 5mA (or 30 mA for dedicated heating cables), a "test" button on the front, and trip circuitry essentially immune to nuisance tripping due to spurious influences such as RF noise.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Branch panelboards shall be securely fastened to the structural framing of the surrounding construction and shall be installed plumb with the surrounding construction. Flush-mounting panelboards shall be installed with their enclosures flush with the finished wall surface.
- B. Height: 6 feet to top of panelboard.
- C. Provide filler plates for unused spaces in panelboards.
- D. In multi-section panelboards, conductors shall directly enter the section to which they make connection, without being routed through other sections. Where this is not possible, the Owner shall be contacted for acceptance of alternate arrangements.

- E. From each flush-mounted panelboard, provide a spare 1-inch and three spare 3/4-inch raceways stubbed into the accessible ceiling space (attic, drop ceiling, etc., as appropriate to the job) and capped. Similarly, IF the structure has an accessible crawl space or ceiling of the floor below, also provide spare 1-inch and three spare 3/4-inch raceways from each panel stubbed down into it and capped.
- F. Conductors shall not be spliced in panelboards.
- G. All conductors shall be routed so as to pass to the outside of the deadfront support brackets and bussing equipment, and shall be provided with a minimum of 3 inches of slack after termination in their designated location.

3.2 CIRCUIT DIRECTORIES

- A. Branch panelboard doors shall have accurate typed circuit directory cards of the two-column type, with odd numbers down the left, and even numbers down the right, with numbers increasing from top to bottom. Multi-pole breakers shall be labeled with each of the single pole spaces occupied. Where room numbers are used, they shall be the final assigned room numbers. Note: Final assigned room numbers may differ from those shown on the drawings.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 26 29 23 - VARIABLE FREQUENCY MOTOR CONTROLLERS

- A. Provide A.C. variable frequency motor controllers as shown on the drawings and as specified herein.

1.2 SUBMITTALS

- A. Shop drawings and maintenance and operating instructions indicating manufacturer, type, ratings, accessories and features for each variable speed motor controller. Include complete schematic wiring and field wiring diagrams. Also include detailed maintenance, testing and operating information, complete parts list, a copy of the manufacturer's warranty, and service availability information.
- B. Provide catalog sheets showing voltage, controller size, ratings and size of switching and overcurrent protective devices, short circuit ratings, dimensions and enclosure details.
- C. Manufacturer's installation instructions indicating application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation and starting of product.
- D. Include with shop drawings a certified statement to the effect that each variable frequency motor controller and its respective motor and mechanical load are totally compatible, and that the motor controller will not adversely affect its associated motor in any way, under any allowable speed conditions.

PART 2 PRODUCTS

2.1 VARIABLE FREQUENCY MOTOR CONTROLLERS

- A. Adjustable frequency (speed)/adjustable voltage motor controller, selectable to control variable or constant torque loads driven by standard NEMA B design squirrel cage induction motors. Allen-Bradley, ABB, Yaskawa, equivalent or equal.
- B. Designed, selected for and totally compatible with, the specific motor and associated mechanical load controlled.
- C. Suitable for the input and a base output of the equipment driven. Provide a constant voltage/frequency ratio over the entire speed range with a minimum short circuit withstand rating of 14,000 RMS symmetrical amperes.
- D. Designed for ability to operate controller with motor disconnected from output.

2.2 RECTIFIER

- A. A 3 phase, full wave diode bridge type shall change fixed voltage, fixed frequency, ac line power to a fixed dc voltage. The rectifier shall be insensitive to the phase rotation of the ac line and shall not cause displacement power factor of less than .95 lagging under any speed and load condition.

2.3 INVERTER

- A. Employ microprocessor-based inverter logic isolated from power circuits.
- B. Inverter to change fixed DC voltage to adjustable frequency AC voltage.

2.4 MOTOR CONTROLLER PROTECTION FEATURES

- A. Immune to incoming phase rotation, line noise and transients, including that from other variable speed motor controllers on the same power distribution system. Motor controller shall not adversely affect other equipment connected to the same power distribution system.
- B. Self-protective (without component failure) against: input undervoltage; input overvoltage; input phase loss; output short circuit; output overload (instantaneous electronic type); output ground fault; output open circuit; and overtemperature. Provide automatic restart after correction/restoration of input undervoltage or input phase loss only. Provide automatic restarting after momentary outage (motor still coasting). Provide lockout and alarm for all other conditions.

2.5 SPEED CHARACTERISTICS

- A. 10-100 percent rated full speed (minimum). Provide minimum and maximum speed settings adjustable and set at 40 percent (24 Hz.) and 100 percent (60 Hz.) respectively; provide independently adjustable maximum current level, maximum torque level, acceleration time, and deceleration time.

2.6 SPEED CONTROL

- A. Automatic: Provide "on" and "off" control by signal from remote normally open (off) contacts in the "automatic" mode. Provide automatic mode motor controller speed, which is proportional to an externally supplied control input.
 - 1. Provide 4-20 mA DC control input interface module.
- B. Manual Mode Speed: Controlled by a one-turn manual speed control potentiometer.
- C. Off Mode: Lock off the motor controller with the motor disconnected from the motor controller by means of the output isolation contactor.

2.7 INSTRUMENTATION AND CONTROLS

- A. Keypad/Display: Provide integral digital keypad/display to set parameters and faults, and to indicate output voltage, output frequency and output current.
- B. Controls: "Manual-Off-Auto" selector switch; manual speed control.
- C. Pilot Lights: Push-to-test, transformer type with 6-volt lamps, one each for: Power on (blue); motor running (green); motor controller malfunction/lockout (red).
- D. All pilot lights, controls and meters to be front-cover mounted and clearly identified.
- E. Provide safety interlock terminals for remote contact to inhibit starting under both manual and automatic mode.
- F. Provide control interlock terminals for remote contact to allow starting in automatic mode.
- G. Provide nameplate for each motor controller identifying load served, per Section 26 05 50.

2.8 DISCONNECTING MEANS

- A. Provide an external operated disconnect switch integral to and on the line side of each controller, common to both the power converter and the bypass.

2.9 OVERCURRENT PROTECTION

- A. Provide internal current limiting fuses installed and wired to the controller input. Fuse protection of the VFD shall limit the available fault current to factory recommendations to protect the control circuit from damage.

2.10 DIAGNOSTICS

- A. Provide LED and/or other indicators to monitor motor controller status and aid in troubleshooting. Include indicators for at least all motor controller lockout conditions.

2.11 ENCLOSURE

- A. Provide NEMA rated enclosure, sized as required and suitable for the environment where the unit will be mounted, to house all components suitable for wall mounting or free floor standing. Provide for proper cooling and ventilation of components. Units shall be suitable for operation with an ambient temperature of up to 40 degrees Celsius.

PART 3 EXECUTION

3.1 GENERAL

- A. Install motor controller in strict accordance with manufacturer's published recommendations. Verify nameplate ratings of motors installed and report any discrepancies.

3.2 START-UP AND TESTING

- A. Provide the services of manufacturer's trained technician to start-up motor controller and test for proper installation and operation. Technician to also provide startup certification and instruction for the Owner's staff in the operation, testing, and maintenance of equipment.

3.3 ADJUSTMENTS

- A. Adjust acceleration, deceleration, minimum current limit, and any other adjustments as recommended by the drive manufacturer to complement load characteristics and achieve optimum performance. Adjust drive to consume no power in the off mode.

3.4 MANUFACTURERS' FIELD SERVICES

- A. Manufacturer's field services shall be provided by a factory certified applications engineer as follows:
 - 1. Prepare and start system.
 - 2. Make final adjustments to installed drives to ensure proper and efficient operation of fan or pump systems. Obtain performance requirements from installer of drive loads.
- B. Demonstrations/training shall be provided by a factory certified applications engineer as follows:
 - 1. Provide systems demonstration and adjust as required to the satisfaction of the Owner.
 - 2. Demonstrate operation of controllers in automatic, bypass and manual modes.

3.5 WARNING LABELS

- A. Describe any and all precautions or procedures that are necessary during operation or maintenance to protect the drive from any possible damage.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 31 10 00 - SITE CLEARING

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Protecting existing vegetation to remain.
 - 2. Removing existing vegetation.
 - 3. Clearing and grubbing.
 - 4. Stripping and stockpiling topsoil.
 - 5. Stripping and stockpiling rock.
 - 6. Removing above- and below-grade site improvements.

1.3 DISCONNECTING, CAPPING OR SEALING, REMOVING SITE UTILITIES. DEFINITIONS

- A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow.
- D. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction
- E. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

- A. Except for materials indicated to be stockpiled or otherwise remain on Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 INFORMATIONAL SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establish preconstruction conditions that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed photographs or video recordings.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.
- B. Topsoil stripping and stockpiling program.
- C. Rock stockpiling program.
- D. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.
- E. Burning: Documentation of compliance with burning requirements and permitting of authorities having jurisdiction. Identify location(s) and conditions under which burning will be performed.

1.6 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed trafficways if required by Owner or authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
 - 1. Do not proceed with work on adjoining property until directed by Engineer.

- C. Utility Locator Service: Notify utility Locator Service for area where project is located before site clearing. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant protection measures are in place.
- D. Tree- and Plant-Protection Zones: Protect according to requirements in Section 015639 "Temporary Tree and Plant Protection."
- E. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist

PART 2 PRODUCTS

2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."
 - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.
- B. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer complying with MPI #23 Surface-tolerant, anticorrosive metal primer.

PART 3 EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed according to requirements in Section 015639 "Temporary Tree and Plant Protection."
- C. Protect existing site improvements from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TREE AND PLANT PROTECTION

- A. Protect trees and plants remaining on-site according to requirements in Section 015639 "Temporary Tree and Plant Protection."

- B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.3 EXISTING UTILITIES

- A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.
 - 1. Verify that utilities have been disconnected and capped before proceeding with site clearing.
- B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed.
 - 1. Arrange with utility companies to shut off indicated utilities.
- C. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than **[two]** days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Owner's written permission.
- D. Excavate for and remove underground utilities indicated to be removed.
- E. Removal of underground utilities is included in earthwork sections; in applicable fire suppression, plumbing, HVAC, electrical, communications, electronic safety and security, and utilities sections; and in Section 024116 "Structure Demolition" and Section 024119 "Selective Demolition."
- F. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches and compact each layer to a density equal to adjacent original ground.

3.4 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.

- B. Strip topsoil to depth of 4 inches in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Remove subsoil and non-soil materials from topsoil, including clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
 - 1. Limit height of topsoil stockpiles to 72 inches
 - 2. Do not stockpile topsoil within protection zones.
 - 3. Stockpile surplus topsoil to allow for resspreading deeper topsoil.

3.5 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
 - 2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.6 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 31 20 00 - EARTH MOVING

- A. Provide all site preparation, excavating, filling, compacting, and related items of work required to complete the earthwork as indicated on the Drawings and as specified herein.
- B. Provide all excavation and backfill as required for the installation of all buried utility work.
- C. Remove from site and legally dispose of all excavated materials that are not suitable for reuse as fill. Disposal site as selected by Contractor.

1.2 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
- B. Excavation: Removal of material of whatever character encountered above subgrade elevations and to lines and dimensions indicated.
- C. Fill: Soil materials used to raise existing grades.
- D. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- E. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.3 INFORMATIONAL SUBMITTALS

- A. Submit qualifications of independent geotechnical engineering testing agency used to perform quality control tests for this work.
- B. Submit the Quality Assurance and Quality Control Plans.
- C. Submit ASTM C-117/C-136 Gradation Analyses for structural fill, sand bedding, pea gravel bedding, or other backfill material specified to be used for this work. Submit test results prior to beginning any backfill work. At the discretion of the Project Manager, a retest and resubmittal may be required when source of material changes or when the appearance of the product delivered to the jobsite varies significantly.

- D. Submit ASTM D-1557 Modified Proctor test results for structural fill, pea gravel bedding, sand bedding, common fill, and in-situ soils below structures requiring compaction of subgrade. Submit test results prior to beginning any backfill work. Retest and resubmittal required when source of fill changes or varies significantly. Determination to be made by the Project Manager.
- E. Submit copies of all ASTM D-2922 compaction test results within 24 hours of the performance of the test.
- F. Product data for each type of plastic warning tape.
- G. Copies of permits required for activities associated with excavation, dewatering, or backfill.
- H. Submit the Traffic Control Plan within 30 days after the Notice to Proceed and at least seven days prior to commencement of excavation operations.

1.4 TRAFFIC CONTROL

- A. The Contractor shall be responsible for conforming to the requirements of Section 6000 – Traffic Control, of the Standards of Construction for College Utilities Corp./Golden Heart Utilities, April 2002 (SOC-CUC/GHU) in addition to the requirements which follow.
- B. The Contractor shall prepare and submit to the Project Manager, the State of Alaska Department of Transportation and Public Facilities, and the City of Fairbanks Engineering Department for review and approval a specific Traffic Control Plan for this project. The TCP shall include any planned full or partial street closures, detours, or other modifications to vehicular or pedestrian traffic within the public right-of-way.
- C. The Traffic Control Plan shall be prepared by someone that is currently certified by the American Traffic Safety Services Association as a Worksite Traffic Safety Supervisor.
- D. The TCP shall be submitted for review within 30 days of the notice to proceed.
- E. If required, publish in a local newspaper any notifications required by the local governing authority.
- F. Do not proceed with any planned modifications to vehicular or pedestrian traffic prior to obtaining an approved TCP.
- G. In writing notify the Fairbanks Fire Department, the Fairbanks Police Department, the Alaska State Troopers and the Fairbanks North Star Borough Emergency Management Department, of all street closures, partial closures, detours or other work that may impede or affect the ability of the departments to respond to emergency service requests. Submit copies of notifications to the Project Manager.

- H. The TCP shall be prepared in accordance with the following referenced standards:
1. SSHC Section 643.
 2. City of Fairbanks Standard Specifications for Road and Utility Construction. (SSRUC).
 3. "Alaska Sign Design Specification", Alaska Department of Transportation and Public Facilities.
 4. MUTCD, Part VI, with the Alaska Supplement.
- I. A Worksite Traffic Supervisor shall be required for this Project. Specific requirements are given in the SSHC, Section 643 - 1.04.
- J. The TCP shall show the types and quantities of signage, complete routes of all detours, any temporary structures required to maintain traffic flow, and a detailed schedule showing the dates and durations of any planned full or partial street closures or other events which affect the flow of vehicular or pedestrian traffic within the public right-of-way.
- K. Revisions to the TCP such as relocating signs, adding additional signs or warning, and control devices to clarify traffic control information based on the traffic patterns shown and similar type revisions shall be considered incidental to the work and will be performed at no additional cost to the Owner.
- L. MANDATORY Pre-Installation Conference:
1. Agenda items, review the following:
 - a. Review Section 01 40 00 for Testing and Inspection administrative requirements and responsibilities and Field Quality Control tests and inspections required of this section.
 - b. Review requirements and frequency of testing and inspections.
 - c. Review installation scheduling, coordination, placement of building concrete, and placement of items installed in and under concrete.
 - d. Review installation scheduling, coordination and placement of site concrete, and of items installed in concrete.
 - e. Review "Verification of Conditions" requirements.
 - f. Review requirements for preparation of subgrade and aggregate base requirements.
 - g. Review formwork requirements.

- h. Review approved mix design requirements, mix designs, and use of admixtures.
 - i. Review reinforcing bar submittals.
 - j. Review installation schedule and placement of reinforcing bars.
 - k. Requirement placement, finishing, and curing of concrete, including cold weather requirements.
 - l. Review joint layout plan for control and expansion joints:
2. Review jointing requirements.
- a. Review concrete slab tolerances and corrective measures if tolerances not met.
 - b. Review safety issues.

1.5 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth-moving operations.
- C. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures are in place.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter and is compactable under the provisions of SSHC 203-3.04 and 203-3.05.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Structural Fill: Material meeting the requirements of SSHC 703-2.09 SUBBBASE, Grading B except that the minus 200 material shall be less than 3 percent.

Meeting the following gradation:

<u>Size</u>	<u>% Passing</u>
4"	100
No. 4 Mesh	30-60
No. 200 Mesh	0-5

E. Unclassified Fill: Earth, sand, gravel, rock, or combinations thereof containing no muck, peat, frozen material, roots, sod, or other deleterious matter and is compactable under the provisions of Part 3 of this Section. Plasticity index shall not be greater than 6 as tested by AASHTO T89 and T90.

F. Non-Frost Susceptible (NFS) Soils or Fill: Sand and gravel containing less than five (5) percent passing the No. 200 sieve, based on the material passing the 3/4-inch sieve.

G. Common Fill under Improvements: Any sandy gravel, sand, sandy-silt, silt, or other common soil materials, containing no debris or organic contamination and is compactable under the provisions of Part 3 of this Section.

H. Common Fill for Area Grading or Landscape Areas: Any sandy gravel, sand, sandy-silt, or other common soil material containing no debris. Organic materials up to 10 percent by weight may be mixed in the soil mass provided the material is reasonably mixed and the organic content does not consist of large roots, stumps or tree limbs.

I. Base Course: Material meeting the requirements of SSHC 703-2.03 AGGREGATE FOR BASE AND SURFACE COURSE, Gradation D-1.

- J. Crushed Aggregate: Base Course: Material meeting the requirements of SSHC 703-2.03 AGGREGATE FOR BASE AND SURFACE COURSE, Gradation D-1. Mechanically crushed and artificially graded mixture of crushed gravel, crushed stones and natural or crushed sand free of organic material, debris or other deleterious material and meeting the following gradation:

<u>Size</u>	<u>% Passing</u>
1	100
3/4"	70-100
3/8"	50-80
No. 4	35-65
No. 8	20-50
No. 50	6-30
No. 200	0-6

At least 70 percent by weight of the particles retained on a No. 4 sieve shall have at least one fractured face as tested by Alaska Test Methods Manual (ATM 305).

- K. Sand: ASTM C 33/C 33M; fine aggregate.

- L. Surface Course Aggregate:

1. E-1 meeting the following gradation:

<u>Size</u>	<u>% Passing</u>
1	100
3/4"	70-100
3/8"	50-85
No. 4	35-65
No. 8	20-50
No. 50	15-30
No. 200	8-15

- M. Bedding Material: Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

2.2 BORROW SOURCE

- A. Use materials from excavation where qualified. Additional materials to come from source of Contractor's choosing. All borrow materials shall be approved by the Project Manager.

2.3 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
1. Red: Electric.
 2. Yellow: Gas, oil, steam, and dangerous materials.
 3. Orange: Telephone and other communications.
 4. Blue: Water systems.
 5. Green: Sewer systems.

PART 3 EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth-moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

- A. Prevent surface water and subsurface or ground water from flowing into excavations and from flooding Project site and surrounding area.
- B. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation support, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.

- C. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collecting or run-off areas. Do not use trench excavations as temporary drainage ditches.
- D. Legally dispose of all water resulting from dewatering or other site operations.
- E. Acquire all permits necessary for dewatering and disposal of dewatering effluent including a State of Alaska Department of Natural Resources Temporary Water Use Permit and a State of Alaska Department of Environmental Conservation Excavation Dewatering Permit.

3.3 EXCAVATION, GENERAL

- A. Refer to SSHC 203-3.01.
- B. General:
 - 1. No excavation work shall be done in the public right-of-way without all barriers and controls in place that are required by the approved Traffic Control Plan.
 - 2. Excavation and backfill in the public right-of-way shall be done in accordance with these Specifications or those of the authority having jurisdiction, whichever is more restrictive.
 - 3. Depth and extent of excavation shall be in conformance with Contract Drawings and Specifications and shall be sufficient for placement of structural fill, bedding or other specified backfill beneath curbs, sidewalks, paved areas, utilities, foundations, slabs, and other structures at elevations shown on Drawings.
 - 4. No excavation is authorized below indicated depths unless so required in writing by Project Manager to obtain suitable bearing materials or to remove objectionable debris.
 - 5. Unauthorized over-excavation beyond limits set by Drawings and/or Specifications shall be replaced with structural fill materials as specified elsewhere in this Section. Backfill and compaction of unauthorized over-excavation shall be at Contractor's expense.
 - 6. Organic and frozen material encountered below required excavation limits shall be removed and replaced with structural fill. Obtain written approval from Project Manager prior to accomplishing work below required excavation limits.
 - 7. Additional authorized excavation below elevations or outside lines as indicated on Drawings shall be paid for as a Contract extra at applicable unit prices.
 - 8. Maintain guardrails and barricades to protect all open cuts. Storage of excavated materials along one side of trench or excavation shall constitute a barricade for that side.

9. Provide adequate lights, flares, and guards as required to protect the public.
 10. Protect adjacent building foundations, utilities, road surfacing, and survey controls by careful excavation and shoring as required.
 11. Provide bridging of excavations as required to permit access to all areas of the job site by other crafts.
 12. Contractor is responsible for excavating all types of material encountered in excavations including frozen soils down to the specified excavation limits without extra cost to the Owner, except for solid rock (where rock is not indicated on Drawings). Solid rock shall consist of igneous, metamorphic and sedimentary rock, which cannot be excavated without the use of blasting or rippers.
- C. Sheeting and Bracing:
1. Contractor is responsible for establishing excavation backslopes and protecting banks for safe working conditions and prevention of erosion.
 2. Furnish, place, and maintain such sheeting and bracing as may be required to support the sides of the trenches and excavation and prevent any movement therein which might damage or delay the work or cause injury to adjacent property, and as necessary to provide full safety for workers and the public. If, in the opinion of the Project Manager, any timbering is inadequate, the Project Manager may order additional supports which must be furnished and placed, but compliance with such orders or failure of the Project Manager to give them shall not release the Contractor from responsibility in respect to the adequate maintenance of trenches or excavation. If necessary to preserve a suitable grade, the trench or excavation shall be solid-sheeted with interlocking sheeting which shall be driven far enough below grade to prevent the in-flow of material from outside the trench or excavation lines. Transverse bulkheads may also be required to prevent movement along the line of the trench.
 3. Unless expressly ordered by the Project Manager, remove all shoring materials from the trench or excavations before or during the backfilling operations. If, in the opinion of the Project Manager, the safety of the street, public or private utilities, or public or private property requires that any portion of the shoring materials be left in the trench, the Project Manager shall so order, in writing, and shall designate particularly what shoring materials be left in place. Sheeting left in the trench shall be cut off about two feet below the finished surface of the ground.

3.4 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.5 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
 - 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.
- C. Bedding Course: Install bedding course where indicated to uniform line and grade to avoid distortions in pipe. Completed bed shall be free of rock formations, protruding stones, frozen lumps, roots and other foreign matter that may cause uneven settlement.

3.6 SUBGRADE INSPECTION

- A. Notify Project Manager when excavations have reached required subgrade.
- B. If Project Manager determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Subgrade preparation under building foundation.
 - 1. Once all unsuitable soils and existing foundation material have been removed, and prior to placement of the structural fill, the base of the excavation should be compacted.
- D. Soft or yielding spots shall be replaced and recompacted. Adjust moisture content as necessary to achieve proper compaction. At the Contractor's option, and at no additional cost to the Owner, the Contractor may place a geotextile separator fabric over the base of the excavation in lieu of replacing and recompacting unsuitable subgrade material. Approval by Project Manager of geotextile material and installation procedure is required, and approval and acceptance is at the sole discretion of the Project Manager.
- E. Compact subgrade to specified compaction requirements.
- F. Subgrade shall have no irregularities varying more than 0.1 foot above or below grade after compaction.
- G. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- H. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Project Manager, without additional compensation.

3.7 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Project Manager.
 - 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Project Manager.

3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 BACKFILL

- A. General:
 - 1. Place and compact backfill in excavations promptly, but not before completing the following:
 - a. Construction below finish grade including, where applicable, subdrainage, damp proofing, waterproofing, and perimeter insulation.
 - b. Surveying locations of underground utilities for Record Documents.
 - c. Testing and inspecting underground utilities.
 - d. Removing concrete formwork.
 - e. Removing trash and debris.
 - f. Removing temporary shoring, bracing, and sheeting.
 - g. Installing permanent or temporary horizontal bracing on horizontally supported walls.
 - 2. Obtain Project Manager's approval of excavations prior to placement of fills.
 - 3. No extra payment for fill in excess of limits shown on Drawings or as specified herein without written approval of Project Manager.
 - 4. Remove all forms, trash and debris from excavation before starting backfill.

5. Lifts shall be placed on level planes. Step sides and bottom of excavations if necessary to accomplish level fills.
 6. Each lift of backfill material to be carried level to all sides of excavated area. No partial fills permitted.
 7. Edges of fills shall be compacted and brought up at a maximum slope of 2:1.
 8. Do not place fill on frozen ground unless specifically authorized by the Project Manager. Placing of fill on frozen ground shall only be done with the prior notification and written approval of the Project Manager.
 9. Structural fill may be placed at or below the water table only with the written approval of the Project Manager.
 10. If backfill is permitted to be placed at or below the water table without dewatering, an initial lift shall be accomplished by end-dumping and blading the structural fill into position. The initial lift shall not rise more than 12 inches above the water table. The fill should then be compacted with a large vibratory compactor. The minimum density of the initial lift should be at least 95 percent of the maximum dry density as determined from the Modified proctor moisture-density relationship. Additional fill may need to be added during compaction to keep the level of the fill above the water table. Fill placement and compaction shall then proceed as specified under placement and backfill Sections of this Specification.
 11. Clean up and grade all areas disturbed by placement of backfill.
- B. Structural Fill:
1. Material required (MINIMUM) beneath referenced structure or area when not specifically detailed on plans:
 - a. Building footings: 12 inches.
 - b. Exterior walks and curbs: 12 inches.
 - c. Interior floor slabs: 6 inches.
 - d. Asphalt paving: 18 inches.
 - e. Concrete parking apron: 12 inches.
 - f. Under precast floor slabs within building: Depth as required to bring grade up to underside of precast floor slabs.
 2. Maximum loose depth of each lift should all be 8 inches in areas to be compacted by machine.

3. Fill in horizontal layers shall not exceed 6 inches loose depth where hand tampers or hand operated vibratory compactors are used.
- C. Sand Bedding:
1. Sand fills shall be placed in lifts as required to fill the designated areas.
 2. Adjust lift thickness, moisture content and placement methods as necessary to achieve specified density.
 3. Water jetting or slurring shall be permitted only with prior approval from the Project Manager.
- D. Common Fill:
1. Use common fill for backfill as shown on the plans and for areas outside of building and paved parking areas, except where other materials are indicated on Drawings.
 2. Maximum loose lift thickness 8 inches under footings or areas to be paved.
 3. Maximum loose thickness 12 inches under area grading or landscape areas.
- E. Structural Slurry:
1. Placement of structural slurry in places other than where required on the plans shall be done only with the prior written approval of the Contracting Officer.
 2. Structural slurry fills shall be placed only after the excavation has been prepared by either formwork or by shaped excavations designed to contain the slurry to properly support an undermined structure. Approval of the excavation or formwork by Contracting Officer is required.
 3. Placement of slurry shall be done by pumping equipment or other approved method only.
 4. Slurry shall be placed to completely fill the excavation, with no air pockets or gaps beneath the structure. Vibratory equipment shall be used as necessary to ensure proper placement and consolidation of the slurry.

3.10 BACK FILL FOR STRUCTURES

- A. Backfill shall be placed at same vertical rate and at same time on both sides of all foundations.
- B. Avoid damage to foundation walls.

- C. Tamp by hand tampers only unless walls are equally backfilled both sides as a simultaneous operation, or unless structural floor system which serves to brace wall is in place and properly anchored.
- D. Backfill against insulation with care to prevent damage.

3.11 BACKFILL AT BURIED UTILITIES, SEWER & STORM DRAINAGE

- A. Unless otherwise shown on the Drawings, the following requirements for pipe placement and bedding shall be met:
 - 1. Bedding and structural fill shall extend the full width of the trench.
 - 2. Water lines to be laid directly on undisturbed soils. Structural fill shall be placed to a depth of 12 inches above the pipe.
 - 3. Sewer lines to be bedded on a minimum of 12 inches of structural fill beneath the pipe and structural fill shall be placed to a depth of 12 inches above the pipe.
 - 4. Electrical and communication conduits to be bedded on a minimum of 3 inches of bedding sand. Sand bedding shall be placed to a depth of 3 inches above the conduits. The same shall apply to conduits superimposed upon one another in the same trench with the exception that there shall be 3 inches of sand between conduits.
 - 5. Backfill remainder of trench as specified. Soils from the excavation may be used in areas designated on the plans as area grading or landscaping provided that it meets the requirements for common fill. Structural Fill shall be used for backfill in areas designated on the plans as paving or under structures.
- B. Clean up and grade all areas disturbed by utility construction.

3.12 WARNING TAPE INSTALLATION

- A. Lay in continuous strip of plastic warning tape for each utility as follows:
 - 1. Water: Blue, place 36 inches above pipe.
 - 2. Sewer: Green, place 36 inches above pipe.
 - 3. Storm Drain: Green, place 36 inches above pipe.
 - 4. Electric: Red, place 24 inches above conduits or direct bury cable.
 - 5. Communications: Orange, place 24 inches above conduits or direct bury cable.
 - 6. Fuel piping: Yellow, place 24 inches above piping.
 - 7. Fuel tanks: Yellow, place 24 inches above tank.

3.13 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.14 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. General:
 - 1. See SSHC 203-3.03.
 - 2. Adjust moisture content as required to accomplish proper compaction and to provide dust control when required by the Project Manager.
 - 3. Compaction shall be thorough and to minimum density specified herein at all points throughout depth of fill.
 - 4. Compact to specified percentage of maximum dry unit weight at optimum moisture content obtainable by AASHTO T-180 and corrected by AASHTO T-224, as required.
 - 5. When multiple lifts are required to achieve the specified grade, each lift shall be compacted to the specified density prior to placing the next lift.

B. Compaction Requirements:

<u>Soil Material</u>	<u>% of Maximum Dry Unit Weight</u>
Top 6 inches of subgrade under structural fill or bedding	95%
Structural Fill	95%
Sand	98%
Pea Gravel	98%
Top 6 inches of subgrade under common fill	90%
Common Fill against foundations and footings within 5 feet of foundation wall	95%
Top 18 inches of Common Fill in areas to receive topsoil	90%

- C. General:
1. Except for rock fills and the first layer of fills over swampy ground, deposit embankment materials in layers not exceeding 8 inches in thickness before compaction.
 2. Compaction shall be thorough.
 3. Compact by routing construction equipment and/or rollers uniformly over the entire surface of each layer before the next layer is placed. Compact until embankment does not rut under the loaded hauling equipment.
 4. Keep dumping and rolling areas separate. Do not cover any lift by another until the required compaction has been completed.

3.15 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
1. Provide a smooth transition between adjacent existing grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:
1. Turf or Unpaved Areas: Plus or minus 1-inch.
 2. Walks: Plus or minus 1-inch.
 3. Pavements: Plus or minus 1/2-inch.
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2-inch when tested with a 10-foot straightedge.

3.16 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course under pavements and walks as follows:
1. Place base course material over subbase course under hot-mix asphalt pavement.

2. Shape subbase course and base course to required crown elevations and cross-slope grades.
 3. Place subbase course and base course 6 inches or less in compacted thickness in a single layer.
 4. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
 5. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.
- C. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
 2. Determine that fill material classification and maximum lift thickness comply with requirements.
 3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.
- D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:
- E. Soil Testing:
1. Soil testing shall be performed by the Contractor's approved independent geotechnical engineering testing agency (see Section 1, TESTING AND INSPECTION SERVICE) according to the approved Quality Control (QC) plan.
 2. OR Maximum dry unit weight determination shall conform with ASTM D-1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- F. Compaction Testing:
1. Test methods:
 - a. Field density testing shall conform with ASTM D-6938 (nuclear gauge method), ASTM D-1556, (Sand-Cone Method) or by ASTM D-2167 (Rainhart Volumeter). The ASTM D-1556 and D-2167 is applicable only to cohesive soils and silty sands and shall only be used to test densities in sand bedding, or common fill which do not contain appreciable amounts of coarse materials in excess of 1.5 inches.

- b. The location of tests shall be at the option of the Project Manager. The number of tests shall be (minimum) as follows. Additional testing shall be required if, in the opinion of the Project Manager, the soil compaction test results indicate that the specified compaction is not being obtained:
 - 1) For embankment and fill under paved areas: One lift per 2000 square feet, but in no case fewer than three tests.
 - 2) For slabs on grade, including sidewalks, aprons, and floors: One per lift per 2000 square feet of slab, but in no case fewer than three tests.
 - 3) For utility trenches: One per lift per 150 linear feet of trench, but in no case fewer than two tests.
 - 4) For landscape or area grading areas: One per lift per 5000 square feet.

3.17 SURVEY MONUMENTS

- A. When placing or replacing survey monuments in public Rights-of-Way, and all asphalt surfaces outside of public Rights-of-Way, install a survey monument case, SDM Drawing M-16.01. When placing survey monuments in other concrete paved areas reference SDM 13.01.
- B. Disturbed Survey Monuments: Employ a qualified Land Surveyor licensed in the state of Alaska to replace any survey monuments disturbed by this project.

3.18 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Project Manager; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 32 12 16 - ASPHALT PAVING

- A. This Section covers Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Asphalt cement pavement surfaces for roadways, drives, and parking areas

1.2 SUMMARY

- A. Section Includes:
 - 1. Hot-mix asphalt patching.
 - 2. Hot-mix asphalt paving.
 - 3. Asphalt surface treatments.
- B. Related Requirements:
 - 1. Section 024116 "Structure Demolition" and Section 024119 "Selective Demolition" for demolition and removal of existing asphalt pavement.
 - 2. Section 312000 "Earth Moving" for subgrade preparation, fill material, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.
 - 3. Section 321373 "Concrete Paving Joint Sealants" for joint sealants and fillers at pavement terminations.
 - 4. Alaska Department of Transportation and Public Facilities "Standard Specification For Highway Construction," 2015 (SSHC)
 - a. SSHC 301 Aggregate Base and Surface Course
 - b. SSHC 401 Hot Mix Asphalt Pavement
 - c. SSHC 402 Tack Coat
 - d. SSHC 403 Prime Coat
 - e. SSHC 702 Asphalt Materials
 - f. SSHC 703 Aggregates

5. American Society for Testing and Materials (ASTM)
 - a. ASTM C 127 Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate
 - b. ASTM C 128 Standard Test Method for Specific Gravity and Absorption of Fine Aggregate
 - c. ASTM D 1557 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - d. ASTM D 2041 Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.
 - e. ASTM D 2172 Quantitative Extraction of Bitumen from Bituminous Paving Mixtures.
 - f. ASTM D 2922 Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - g. ASTM D 2950 Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
 - h. ASTM D 3017 Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
6. American Association of State Highway and Transportation Officials (AASHTO)
 - a. AASHTO M 226 Viscosity Graded Asphalt Cement
 - b. AASHTO M 320 Standard Specification for Performance Graded Asphalt Binder
 - c. ASTM D5801 Standard Test Method for Toughness and Tenacity of Bituminous Materials
 - d. AASHTO T 53 Softening Point of Bitumen (Ring-and-Ball Apparatus)
 - e. AASHTO T 30 Mechanical Analysis of Extracted Aggregate
 - f. AASHTO T-180 Moisture-Density Relation of Soils
 - g. AASHTO T-224 Correction for Coarse Particles in the Soil Compaction Test
 - h. AASHTO T 245 Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus
7. Asphalt Institute Manual
 - a. MS-2 Mix Design Methods for Asphalt Concrete

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include technical data and tested physical and performance properties.
 - 2. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
- B. Submit gradation test results minimum (three each) from base course and course and paving aggregate stockpile for [Engineer or Contracting Officer] review.
- C. Submit qualifications of independent engineering testing agency used to perform quality control test for this work.
- D. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate with international symbol of accessibility, spaces allocated for people with disabilities.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Manufacturer and Testing Agency.
- B. Material Test Reports: For each paving material, by a qualified testing agency.
- C. Field quality-control reports within 24 hours of the performance of the test.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of state in which Project is located
- B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.
- C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of SSHC 2015 for asphalt paving work.
 - 1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
1. Prime Coat: Minimum surface temperature of 45 degrees F.
 2. Tack Coat: Minimum surface temperature of 40 degrees F.
 3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
 4. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
 5. Asphalt Surface Course: Minimum surface temperature of 60 degrees F at time of placement.

PART 2 PRODUCTS

2.1 AGGREGATES

- A. Conform to SSHC 703-2.04.

2.2 ASPHALT MATERIALS

- A. Asphalt Binder: SSHC 702-2.01
- B. Cutback Prime Coat: SSHC 702-2.02
- C. Emulsified Asphalt Prime Coat: SSHC 702-2.03
- D. Tack Coat: SSHC 402-2.01.
- E. Water: Potable.
- F. Undersealing Asphalt: ASTM D 3141/D 3141M; pumping consistency.

2.3 AUXILIARY MATERIALS

- A. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material; and recycled tires, asphalt shingles, or glass from sources and gradations that have performed satisfactorily in previous installations, equal to performance of required hot-mix asphalt paving produced from all new materials.

B. Sand: ASTM D 1073 or ASHTO M 29, Grade No. 2 or No. 3.

C. Joint Sealant: SSHC 702-2.06

2.4 MIXES

A. The job mix shall conform to SSHC Section 401-2.09, Class [A], [B], Type [I], [II], [III].

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction repeating proof -rolling in direction perpendicular to first.. Limit vehicle speed to 3 mph.

2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.

3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 CONSTRUCTION REQUIREMENTS:

A. SSHC 401-3.03-3.20.

3.3 PATCHING

A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

- B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseal concrete pieces firmly.
 - 1. Pump hot undersealing asphalt under rocking slab until slab is stabilized or, if necessary, crack slab into pieces and roll to reseal pieces firmly.
 - 2. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.
- C. Tack Coat: Before placing patch material, apply tack coat uniformly to vertical asphalt surfaces abutting the patch. Apply at a rate of 0.05 to 0.15 gallons/square yard.
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
- D. Placing Patch Material: Fill excavated pavement areas with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will Engage a qualified testing agency to perform tests and inspections.
- B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.
- C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979 or AASHTO T 168.
 - 1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.

2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.
 - a. One core sample will be taken for every 1000 sq. yd. or less of the installed pavement, with no fewer than three cores taken.
 - b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.
- E. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.5 WASTE HANDLING

- A. General: Handle asphalt-paving waste according to approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 32 16 13 - CONCRETE SIDEWALKS, CURBS, AND GUTTERS

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

1.2 SUMMARY

- A. Section includes concrete paving, including the following:
 - 1. Curbs.
 - 2. Sidewalks.
- B. Related Requirements:
 - 1. State of Alaska Department of Transportation and Public Facilities STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2020 Edition, (SSHC).

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Cold Weather Concreting Plan.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified ready-mix concrete manufacturer and testing agency.

B. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Fiber reinforcement.
4. Admixtures.
5. Curing compounds.
6. Applied finish materials.
7. Bonding agent or epoxy adhesive.
8. Joint fillers.

C. Material Test Reports for each of the following:

1. Aggregates.

1.6 QUALITY ASSURANCE

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94 requirements for production facilities and equipment.
- B. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1.7 FIELD CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
- B. Admixtures. Use only admixtures shown in the approved mix design. Do not use calcium chloride.

1.8 ENVIRONMENTAL CONDITIONS

- A. Cold Weather: ACI 306.1 Cold weather is defined as a period when for more than 3 consecutive days the mean daily temperatures drop below 40 degrees F. When temperatures above 50 degrees F occur during more than half on any 24-hour period, the concrete should no longer be regarded as winter concrete. Heating of concrete should not exceed 90 degrees F.

- B. Inclement weather: Protect freshly placed concrete against damage by infiltration of any adverse weather. When damage might occur: (1) stop the concrete placement against the nearest construction joint or bulkhead and (2) cover the concrete at once with waterproof protection until concrete has set.
- C. Sprayed-on Protective Coatings: Apply in accordance with manufacturer's written instructions. Protection from rain, air moisture, or large temperature ranges shall be provided in accordance with the manufacturer's instructions.
- D. Hot Weather: ACI 305R. Work plans must include preparation to limit the temperature effects on concrete. As the selected limiting temperatures, usually but not always between 75 degrees F to 100 degrees F is approached and exceeded, unfavorable effects of high temperature are likely.

PART 2 PRODUCTS

2.1 SIDEWALKS, ROADWAYS, DRIVEWAYS, PARKING LOTS AND OTHER CONCRETE PAVED AREAS.

- A. See SSHC 608-2.01 MATERIALS, except Concrete shall be Class A-A.

2.2 CURBS AND GUTTERS

- A. See SSHC 609-2.01 MATERIALS, except Concrete shall be Class A-A.

2.3 CONCRETE MIXTURE

- A. Comply with SSHC 501-2.01.
- B. Strength – 3500 psi at 28 days.
- C. Aggregates – Maximum aggregate to be 1 inch minus.
- D. Air Content – 5 to 7 percent air entrainment.
- E. Slump – 6 inches maximum at truck chute discharge point.
- F. Water – Potable ASTM C94
- G. Acceptance of Concrete will be as described in Field Quality Control, of this specification.

2.4 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.
 - 1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less. Do not use notched and bent forms.
 - 2. Forms to be of a height equal to the full depth of concrete.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.5 STEEL REINFORCEMENT

- A. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064, fabricated from steel wire into flat sheets.
- B. Reinforcing Bars: ASTM A 615, Grade 40; deformed.
- C. Joint Dowel Bars: ASTM A 615, Grade 40 plain-steel bars. Cut bars true to length with ends square and free of burrs.
- D. Tie Bars: ASTM A 615, Grade 40 deformed.

2.6 CURING MATERIALS

- A. White Pigmented Membrane-Forming Curing Compound conforming to ASTM C309, Type 2.
- B. Evaporation retarder
- C. Burlap must conform to AASHTO M 182, weighing approximately 9 ounces/square yard when dry.
- D. Impervious sheet materials moisture retaining cover must conform to ASTM C171, optional type (except that polyethylene film, if used, must be white opaque).
- E. Potable water.

PART 3 EXECUTION

3.1 GENERAL

- A. See SSHC 501-3.03 – 3.08.

3.2 SIDEWALKS, ROADWAYS, DRIVEWAYS, PARKING LOTS AND OTHER CONCRETE PAVED AREAS

- A. See SSHC 608-3.01 CONCRETE SIDEWALKS.
- B. Test subgrade cross section grade extending full width of sidewalk and supported between side forms.

3.3 CURBS AND GUTTERS

- A. See SSHC 609-3.01 through 3.03 and 609-3.05.
- B. Test subgrade cross section for grade by template extending the full width of the curb and gutter. The subgrade must be of materials equal in bearing quality to the subgrade under the adjacent pavement.

3.4 SUBGRADE

- A. Maintain moist condition when concrete is placed.
- B. Protect and prepare to be free from frost when concrete is deposited.

3.5 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. The sole responsibility for form design and for any resulting structural damage due to form failure rests with the Contractor.

3.6 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. Install welded-wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.

3.7 CONCRETE PLACEMENT

- A. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. 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.
- B. Cold-Weather Concrete Placement
 - 1. Submit a written cold weather concreting plan when air temperatures are expected to fall below 35 degrees F during the cure period. Obtain the Engineer's approval of the plan and put it into effect before placing any concrete when the descending air temperature in the shade, away from artificial heat, falls below 40 degrees F or, in the opinion of the Engineer, will likely do so within 24 hours after concrete is placed. Have in place the materials and equipment required to heat mixing water and aggregate and to protect freshly placed concrete from freezing.

2. Temperature of Concrete. When the air temperature falls below 40 degrees F, ensure that concrete placed in forms has a temperature between 50 degrees F and 70 degrees F. Obtain these temperatures by heating the mixing water and/or aggregate. Heat mixing water to no more than 160 degrees F.
 - a. Do not use binned aggregates that contain ice, are frozen, or have been heated directly by gas or oil flame or on sheet metal over an open fire. When heating aggregates in bins, use steam-coil or water-coil heating. Use other methods only when approved. If using live steam to thaw frozen aggregate piles, completely drain excess moisture.
 - b. When the temperature of the water or aggregate exceeds 100 degrees F, mix them together so that the temperature of the mix does not exceed 80 degrees F when the cement is added.
3. Cold Weather Placement. When placing concrete in cold weather, follow these precautions in addition to the above requirements:
 - a. Heat forms and reinforcing steel before placing concrete to remove frost, ice, and snow from surfaces that will contact fresh concrete.
 - b. When fresh concrete will contact hardened concrete, warm the surface of the hardened concrete to at least 35 degrees F and thoroughly wet. Remove free water before placing fresh concrete.
 - c. Protection of Concrete. When using Type I or II cement, maintain freshly placed concrete at a temperature of at least 70 degrees F for 3 days or at least 50 degrees F for 5 days. When using Type III cement, maintain concrete at a temperature of at least 70 degrees F for 2 days or at least 50 degrees F for 3 days. The above requirements do not apply when the concrete is no longer in danger of freezing or when air temperatures of 40 degrees F or higher are anticipated during the 2 weeks after concrete placement.
 - d. Maintain the concrete temperature using methods such as insulated forms, enclosures, and indirect heat. Maintain curing moisture. Protect the structure from overheating and fire.
 - e. At the end of the curing period, remove the protection so the concrete drops in temperature gradually and not more than 30 degrees F in the first 24 hours.
 - f. When placing concrete within cofferdams and curing it by flooding with water, the above conditions do not apply if the water that contacts the concrete is not allowed to freeze. Wait to dewater until the Engineer determines that the concrete has cured enough to withstand freezing temperatures and hydrostatic pressure.

4. Protect the concrete during cold weather operations. Remove and replace concrete injured by frost action or overheating at no cost to the Owner.
- C. Hot-Weather Placement: Comply with ACI 301 and as follows:
1. Maintain concrete temperature below 90 degrees Fahrenheit at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.8 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer.
1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 2. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 3. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Sidewalk joints must be constructed to divide the surface into rectangular areas. Transverse contraction joints must be spaced at a distance equal to the sidewalk width or 5 feet on centers, whichever is less, and must be continuous across the slab. Longitudinal contraction joints must be constructed along the centerline of all sidewalks 10 feet or more in width. Transverse expansion joints must be installed at sidewalk returns and opposite expansion joints in adjoining curbs. Where the sidewalk is not in contact with the curb, transverse expansion joints must be installed as indicated. Expansion joints must be formed about structures and features which project through or into the sidewalk pavement, using joint filler of the type, thickness, and width indicated. Expansion joints are not required between sidewalks and curb that abut the sidewalk longitudinally.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: 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.
 2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.9 TOLERANCES

- A. Comply with tolerances in ACI 117 and as follows:
1. Elevation: 3/4-inch.
 2. Thickness: Plus 3/8-inch, minus 1/4-inch.
 3. Surface: Gap below 10-foot- long; unlevelled straightedge not to exceed 1/2-inch.
 4. Joint Spacing: 3 inches.
 5. Contraction Joint Depth: Plus 1/4-inch, no minus.
 6. Joint Width: Plus 1/8-inch, no minus.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:
1. Testing Frequency: Obtain at least one composite sample for each 100 cubic yards (curb and gutter) or 5000 square feet (sidewalks, drives, roadways, parking lots) or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231/C 231M, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 degrees F and below and when it is 80 degrees F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.
 - a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.
- C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- D. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.
- F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer.
- G. Concrete paving will be considered defective if it does not pass tests and inspections.
- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- I. Prepare test and inspection reports.

3.11 REPAIR AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Engineer.
- B. Drill test cores, where directed by Engineer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with Portland cement concrete bonded to paving with epoxy adhesive.
- C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE: SECTION 33 63 21 - DIRECT BURIED STEAM AND CONDENSATE

- A. This Section covers post-insulated Direct Buried Steam and Condensate piping.

1.2 SUBMITTALS

- A. Manufacturer's data, catalog cuts and selections of pipe, joints, fittings, union, nipples, and flanges are not required.
- B. Application Schedule: Submit a schedule of pipe, joints, fittings, unions, and flanges listing the application, product, material, and size proposed for each application.

PART 2 PRODUCTS

2.1 GENERAL

- A. Provide a post-insulated piping system consisting of an inner pipe enclosed by multi-layered insulation and an outer jacket.

2.2 PIPE

- A. Steam Piping: Black Carbon Steel, Electric Resistance Welded ASTM A53, Grade B or Seamless ASTM A53, Grade B, or A106 Grade B; Schedule 40 (std.).
- B. Condensate Piping: Black Carbon Steel, Electric Resistance Welded ASTM A53, Grade B or Seamless ASTM A53, Grade B, or A106 Grade B; Schedule 80 (XS).
- C. Sizes on Drawings indicate nominal size of core pipe.
- D. Factory fabricated pipe and fittings.

2.3 INSULATION

- A. Steam piping and fittings shall be insulated with a multi-layer insulating system as described below and indicated on the drawings.
 - 1. Inner layer insulation shall be cellular glass insulation pre-formed for the pipe size on which it is installed. Cellular glass insulation shall be nominal 2 inches in thickness with high temperature adhesive bonded joints. Insulation and joining material shall be rated for 500°f service. Similar to Owens Corning Foamglas psh preformed pipe shells.
 - 2. Outer layer insulation shall be comprised of spray applied high temperature urethane foam insulation, minimum two-inch thick. Outer layer insulation shall have a protective surface coating applied to a minimum 80-mil thickness. Coating similar to Polycoat products Polyeuro mpl 501
- B. Condensate piping and fittings shall be insulated with a multi-layer insulating system as described below and indicated on the drawings.
 - 1. Inner layer insulation shall be cellular glass insulation pre-formed for the pipe size on which it is installed. Cellular glass insulation shall be nominal 1-inch in thickness with high temperature adhesive bonded joints. Insulation and joining material shall be rated for 500 degree F service. Similar to Owens Corning Foamglas psh preformed pipe shells.
 - 2. Outer layer insulation shall be comprised of spray applied high temperature urethane foam insulation, minimum 1-inch thick. Outer layer insulation shall have a protective surface coating applied to a minimum 80 mil thickness. Coating similar to Polycoat products polyeuro mpl 501

PART 3 EXECUTION

3.1 TESTING

- A. Hydrostatically test new and existing medium and high-pressure systems at 200-psig for one hour with no noticeable leaks or pressure drop.
- B. Report any leaks in the existing system to the Contracting Officer. At the option of the Contracting Officer, they will issue a Contract Amendment to repair leaks or will have Government maintenance personnel repair the leaks.
- C. Testing minor modifications to existing system by returning system to normal operating conditions and visually inspect new joints for leaks.

END OF SECTION

Submittal Register

Printed on:
8/21/2025

Project: City Hall Heating System Replacement
Project No: 202401

Owner: City of Fairbanks
Contractor:
Consultant: Design Alaska, Inc.

SD-01 Preconstruction; SD-02 Shop Drawings; SD-03 Product Data; SD-04 Samples; SD-05 Design Data; SD-06 Test Report; SD-07 Certificates; SD-08 Manufacturer's Instructions; SD-09 Manufacturer's Report; SD-10 O&M Data; SD-11 Closeout; SD-12 LEED

1=No Exception Taken; 2 = Accepted as Noted; 3 = Revise & Resubmit; 4 = Submit Specified Item; 5 = Rejected

Item No.	Transmittal No.	Spec. Section or Drawing No.	Submittal Description	Spec. Paragraph or Drawing Detail No.	Item Description	Contractor's Scheduled Submittal Date	Actual		Status	Review Comments
							Submittal Date	Return Date		
01 26 00										
Contract Modification Procedures										
1		1.2.A	SD-01		Name of Authorized Change Order Individual					
2		1.2.B	SD-01		Change Order Forms					
01 33 00										
Submittal Procedures										
1		1.3	SD-01		Submittal Register					
2		1.4	SD-01		Construction Progress Schedules					
3		1.5	SD-01		Schedule of Values					
01 35 43										
Environmental Protection										
1		1.2.A.1	SD-01	1.4	Environmental Protection Plan (EPP)					
01 45 00										
Quality Control										
1		1.2.A,B,C	SD-01		Testing Laboratory Information					
01 70 00										
Contract Closeout										
1		1.5.C.1	SD-10		Architectural Materials and Finishes O&M Manual					
2		1.5.C.2	SD-10		Mechanical Equipment O&M Manual					
3		1.5.C.3	SD-10		Electrical Equipment O&M Manual					
01 73 29										
Cutting and Patching										
1		1.2.A	SD-01		Written Request - Cutting or Alteration					
02 82 33										
Removal and Disposal of Asbestos Containing Materials										
1		1.13.A.1	SD-02	1.13.B	Shop Drawings					
2		1.13.A.2	SD-01	1.13.C	Work Plan					
3		1.13.A.3	SD-01	1.13.D	Liability Insurance Policy and Performance Bond					
4		1.13.A.4	SD-01	1.13.E	Schedule					
5		1.13.A.5	SD-07	1.13.F	Testing Laboratory and Laboratory Personnel					
6		1.13.A.6	SD-07	1.13.G	Disposal Site Designations and Disposal Authorizations					
7		1.13.A.7	SD-07	113.g	Waste Transporter Designation					
8		1.13.A.8	SD-07	1.13.J	Notifications and Certifications					
9		1.13.A.9	SD-07	1.13.K	"Competent Person" Designation and Experience					
10		1.13.A.10	SD-01	1.13.L	Request for Substitutions					
02 83 34										
Removal and Disposal of Materials Containing Lead and PCBs										
1		1.13.A.1	SD-02	1.13.B	Shop Drawings					

Corrections or comments do not relieve Contractor from compliance with Contract Documents. Submittals are reviewed only for general conformance with the design concept of the project and general compliance with the Contract Documents. The Contractor is responsible for confirming compliance with the Contract Documents, confirming & correlating all quantities & dimensions, selecting fabrication processes, techniques of construction, coordinating his work with that of other trades, and existing conditions; and performing his work in a safe and satisfactory manner.

Reviewed By _____

Date _____

Printed on:
8/21/2025

Project: City Hall Heating System Replacement
Project No: 202401

Owner: City of Fairbanks
Contractor:
Consultant: Design Alaska, Inc.

SD-01 Preconstruction; SD-02 Shop Drawings; SD-03 Product Data; SD-04 Samples; SD-05 Design Data; SD-06 Test Report; SD-07 Certificates; SD-08 Manufacturer's Instructions; SD-09 Manufacturer's Report; SD-10 O&M Data; SD-11 Closeout; SD-12 LEED

1=No Exception Taken; 2 = Accepted as Noted; 3 = Revise & Resubmit; 4 = Submit Specified Item; 5 = Rejected

Item No.	Transmittal No.	Spec. Section or Drawing No.	Submittal Description	Spec. Paragraph or Drawing Detail No.	Item Description	Contractor's Scheduled Submittal Date	Actual		Status	Review Comments
							Submittal Date	Return Date		
2		1.13.A.2	SD-01	1.13.C	Work Plan					
3		1.13.A.3	SD-01	1.13.D	Liability Insurance Policy and Performance Bond					
4		1.13.A.4	SD-01	1.13.E	Schedule					
5		1.13.A.5	SD-07	1.13.F	Testing Laboratory and Laboratory Personnel					
6		1.13.A.6	SD-07	1.13.G	Disposal Site Designations and Disposal Authorizations					
7		1.13.A.7	SD-07	113.g	Waste Transporter Designation					
8		1.13.A.8	SD-07	1.13.J	Notifications and Certifications					
9		1.13.A.9	SD-07	1.13.K	"Competent Person" Designation and Experience					
10		1.13.A.10	SD-01	1.13.L	Request for Substitutions					
02 41 19					Selective Demolition					
1		1.2.A	SD-01		Permits and Notification					
2		1.2.B	SD-11		Dump Receipts, Bills of Lading, Handling and Tracking Records					
20 05 29					Hangers and Supports for Mechanical					
1		1.2.A	SD-03	2.2.A	Non Insulated Pipe Hangers					
2		1.2.A	SD-03	2.2.B	Insulated Pipe Hangers					
3		1.2.A	SD-03	2.3	Riser Clamps					
4		1.2.A	SD-03	2.4	Hanger Rods					
5		1.2.A	SD-03	2.5	Channel Struts					
6		1.2.A	SD-03	2.6	Articulating Hanger Systems					
7		1.2.A	SD-03	2.7	Steel Wall Brackets					
8		1.2.A	SD-03	2.8	Concrete Inserts					
9		1.2.A	SD-03	2.9	Concrete Anchor Bolts					
10		1.2.A	SD-03	2.10	Roller Supports and Protection Saddles					
11		1.2.A	SD-03	2.11	Pipe Alignments					
12		1.2.A	SD-03	2.12	Chair Anchors					
13		1.2.A	SD-03	2.13	Slide Plate Assemblies					
14		1.2.B	SD-01		Application Schedule					
15		1.2.C.1	SD-06		Test Reports: Third Party					
16		1.2.C.2	SD-06		Concrete Anchors Special Inspection Form					
17		1.2.D	SD-02		Shop Drawings: Fabricated Items					
20 05 48					Seismic Controls for Mechanical Deferred Design					
1		1.2.A	SD-01		Name and Contact of Restraint Designer					
2		1.2.B	SD-03		Factory Seismic Restraint Systems					
3		1.2.C	SD-01		Application Schedule					
4		1.2.D	SD-06		Test Reports and Certificates					

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6		1.2.E	SD-01		Plan with Locations					
7		1.2.F	SD-02		Shop Drawings and Calculations					
8		1.2.G	SD-01		Restraint Detail Index					
20 05 53										
Identification for Mechanical										
1		1.2.A	SD-03	2.1.A	Pipe Markers: Pressure Sensitive					
2		1.2.A	SD-03	2.2.A	Pipe Markers: Removable					
3		1.2.A	SD-03	2.3	Valve Tags and Cold Piping Accessory Tags					
4		1.2.A	SD-03	2.4	Equipment Labels					
5		1.2.A	SD-03	2.5	Access Panel and Ceiling Identification Markers					
6		1.2.A	SD-03	2.6	Buried Utility Line Markers					
7		1.2.B	SD-01		Valve Tag Schedule					
20 07 00										
Insulation for Mechanical										
1		1.2.A	SD-03	2.1.C	Lagging Fabric					
2		1.2.A	SD-03	2.1.D	Thermal Insulation Coatings					
3		1.2.A	SD-03	2.1.E	Insulating Cement					
4		1.2.A	SD-03	2.1.F	Vapor Barrier Coatings					
5		1.2.A	SD-03	2.1.G	Plastic Insulation Covers					
6		1.2.A	SD-03	2.1.H	Metal Jackets					
7		1.2.A	SD-03	2.2.A	Interior, Above Grade, Piping System Insulation					
8		1.2.B	SD-01		Application Schedule					
23 05 00										
Common Work Results for HVAC										
1		1.2.A	SD-03	2.2	Thermometers					
2		1.2.A	SD-03	2.3	Pressure Gauges					
3		1.2.A	SD-03	2.4	Steam Pressure Gauges					
4		1.2.A	SD-03	2.5	Pressure and Temperature Test Ports					
5		1.2.A	SD-03	2.6	Balancing Cocks					
6		1.2.A	SD-03	2.7	Flexible Connectors					
7		1.2.A	SD-03	2.8	Air Vents					
8		1.2.A	SD-03	2.9	Strainers					
9		1.2.A	SD-03	2.10	Mechanical Pipe Seals					
10		1.2.A	SD-03	2.11	Dielectric Pipe Protection					
11		1.2.A	SD-03	2.12	Escutcheons					
12		1.2.A	SD-03	2.13	Flow Test Kit					
13		1.2.B	SD-01		Balancing Cock Schedule					
14		1.2.C	SD-02		Substantial Deviations					
23 05 23										
General Duty Valves for HVAC										

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1		1.2.A	SD-03	2.2.A.1.a	Valves 3 Inches and Smaller: Isolation Ball Valves					
2		1.2.A	SD-03	2.2.A.1.b	Valves 3 Inches and Smaller: Isolation Gate Valves					
3		1.2.A	SD-03	2.2.A.1.c	Valves 3 Inches and Smaller: Drain Valves					
4		1.2.A	SD-03	2.2.A.2	Valves 3 Inches and Smaller: Globe Valves					
5		1.2.A	SD-03	2.2.A.3	Valves 3 Inches and Smaller: Check Valves					
6		1.2.A	SD-03	2.2.B.3	Valves 4 Inches and Larger: Isolation Valves					
7		1.2.A	SD-03	2.2.B.4	Valves 4 Inches and Larger: Globe Valves					
8		1.2.A	SD-03	2.2.B.5	Valves 4 Inches and Larger: Check Valves					
9		1.2.A	SD-03	2.2.B.6	Valves 4 Inches and Larger: Non-Slam Check Valves					
10		1.2.A	SD-03	2.3.A.1	Valves 2 Inches and Smaller: Gate Valves					
11		1.2.A	SD-03	2.3.B.1	Valves Larger than 2 Inches: Isolation Valves					
12		1.2.A	SD-03	2.3.B.2	Valves Larger than 2 Inches: Globe Valves					
13		1.2.A	SD-03	2.3.B.3	Valves Larger than 2 Inches: Check Valves					
14		1.2.A	SD-03	2.4.A.2	Valves 3 Inches and Smaller: Isolation Valves					
15		1.2.A	SD-03	2.4.A.3	Valves 3 Inches and Smaller: Globe Valves					
16		1.2.A	SD-03	2.4.A.4	Valves 3 Inches and Smaller: Check Valves					
17		1.2.A	SD-03	2.4.B.2	Valves Larger than 4 Inches: Isolation Valves					
18		1.2.A	SD-03	2.4.B.3	Valves Larger than 4 Inches: Globe Valves					
19		1.2.A	SD-03	2.4.B.4	Valves Larger than 4 Inches: Check Valves					
20		1.2.B	SD-01		Application Schedule					
23 05 93					Testing, Adjusting and Balancing for HVAC					
1		1.2.A	SD-01		Balancer Qualifications and Balancing Plan					
2		1.2.B	SD-06		Test and Balancing Report					
23 09 23					Direct Digital Control System for HVAC					
1		1.2.D	SD-01		Contractor Qualifications					
2		1.4.A	SD-05		Index					
3		1.4.B	SD-05		Alternate Approach Description					
4		1.5.E.1	SD-05		System Architecture Diagram					
5		1.5.E.2	SD-05		Riser Diagram					
6		1.5.E.3	SD-05		Control Valve Schedule					
7		1.5.E.4	SD-05		Damper Actuator Schedule					
8		1.5.E.5	SD-05		Subpanel and panel face layouts					
9		1.5.E.6	SD-05		Heating Plant Control Diagrams					
10		1.5.E.7	SD-05		Terminal Unit Control Diagrams					
11		1.5.E.8	SD-05		I/O Interface Diagrams					
12		1.6.A	SD-03	2.1.C.2	Local Workstation					
13		1.6.A	SD-03	2.2.B	Network Controllers					
14		1.6.A	SD-03	2.2.C	Modular Direct Digital Controllers					

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15		1.6.A	SD-03	2.2.D	Applications Specific Direct Digital Controllers					
16		1.6.A	SD-03	2.3	Auto Dialers					
17		1.6.A	SD-03	2.4	Temperature Sensors					
18		1.6.A	SD-03	2.5	Pressure Sensors					
19		1.6.A	SD-03	2.6	Other Sensors					
20		1.6.A	SD-03	2.7	Thermostats and Temperature Switches					
21		1.6.A	SD-03	2.8	Liquid Level Switches					
22		1.6.A	SD-03	2.9	Other Switches					
23		1.6.A	SD-03	2.10	Signal Conditioners					
24		1.6.A	SD-03	2.11	Control Relays					
25		1.6.A	SD-03	2.12	Meters					
26		1.6.A	SD-03	2.13	Gauges and Indicators					
27		1.6.A	SD-03	2.14	Control Valves					
28		1.6.A	SD-03	2.15	Wiring and Raceways					
29		1.6.A	SD-03	2.16	Panels					
30		1.7.A.1	SD-10	1.8	Operation and Maintenance Manuals					
31		1.7.A.2	SD-11		Training Schedule and Course Outlines					
32		1.7.A.3	SD-11		Graphic and Tabular Screens					
33		1.7.A.4	SD-11		History Index					
23 21 13					Hydronic Piping					
1		1.2.A	SD-03	2.2	Heating System Fluid					
2		1.2.A	SD-03	2.3	Heating System Chemical Cleaning Compound					
3		1.2.A	SD-03	2.4	Glycol Concentration Testing Device					
4		1.2.B	SD-01		Application Schedule					
23 21 16					Hydronic Piping Specialties					
1		1.2.A	SD-03	2.1	Pressure Relief Valves					
2		1.2.A	SD-03	2.2	Air Separators					
3		1.2.A	SD-03	2.3	Diaphragm Expansion Tanks					
4		1.2.A	SD-03	2.4	Finned Tube Radiation Piping Expansion Compensators and					
5		1.2.A	SD-03	2.5	Glycol Mixing Tanks					
23 21 23					Hydronic Circulating Pumps					
1		1.2.A	SD-03	2.2.B	In-line Centrifugal Pumps					
23 22 00					Steam Heating System					
1		1.2.A	SD-03	2.3.A.1	Thermodynamic Trap					
2		1.2.A	SD-03	2.3.A.2	Float and Thermostatic - 1-1/2" and Smaller					

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3		1.2.A	SD-03	2.3.A.3	Float and Thermostatic - 2" and Larger					
4		1.2.A	SD-03	2.4	Pressure Reducing Valve					
5		1.2.A	SD-03	2.5	Vacuum Breakers					
6		1.2.A	SD-03	2.6	Steam Pressure Relief Valves					
7		1.2.A	SD-03	2.7	Moisture Separator					
8		1.2.B	SD-01		Application Schedule					
23 37 13					Diffusers, Registers and Grilles					
1		1.2.A	SD-03	2.2	Louvered Grille/Register					
2		1.2.A	SD-03	2.6	Linear Bar Grille					
23 57 16					Shell and Tube Heat Exchanger					
1		1.2.A	SD-03	2.1	Shell and Tube Heat Exchanger					
23 82 19					Fan Coil Units					
1		1.2.A	SD-03	2.1	Fan Coil Units					
23 82 36					Finned Tube Radiation - Commercial					
1		1.2.A	SD-03	2.1.A	Finned Tube Radiation					
23 82 39					Unit Heaters					
1		1.2.A	SD-03	2.1	Fixed Discharge Unit Heaters					
2		1.2.A	SD-03	2.2	Vibration Isolators					
3		1.2.B	SD-04		Sample: Enclosure Finish and Color					
23 82 43					Cabinet Unit Heaters					
1		1.2.A	SD-03	2.3	Vertical Unit					
2		1.2.B	SD-04		Sample: Enclosure Finish and Color					
26 24 18					Branch Circuit Panelboards					
1		1.2.A,B	SD-03	2.2.A	Branch Panelboards					
2		1.2.A,B	SD-03	2.3	Branch Circuit Breakers					
26 29 23					Variable Frequency Motor Controllers					
1		1.2.A	SD-02 SD-10		Shop Drawings and Maintenance and Operating Instructions					
2		1.2.B	SD-03	2.1	Variable Frequency Motor Controllers					
3		1.2.B	SD-03	2.2	Rectifier					
4		1.2.B	SD-03	2.3	Inverter					

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5		1.2.B	SD-03	2.4	Motor Controller Protection Features					
6		1.2.B	SD-03	2.6	Speed Control					
7		1.2.B	SD-03	2.7	Instrumentation and Controls					
8		1.2.B	SD-03	2.9	Overcurrent Protection					
9		1.2.B	SD-03	2.11	Enclosure					
10		1.2.C	SD-08		Manufacturer's Instructions					
11		1.2.D	SD-07		Certified Statement of Compatibility					
31 10 00					Site Clearing					
1		1.5.A	SD-01		Existing Conditions					
2		1.5.B	SD-01	1.7.A	Topsoil Stripping and Stockpiling Program					
3		1.5.C	SD-01	1.7.B	Rock Stockpiling Program					
4		1.5.D	SD-02		Record Drawings					
5		1.5.E	SD-01		Burning Documentation					
31 20 00					Earth Moving					
1		1.3.A	SD-07		Testing Agency Qualifications					
2		1.3.B	SD-01		Quality Assurance and Quality Control Plans					
3		1.3.C	SD-06		Gradation Analyses					
4		1.3.D	SD-06		Modified Proctor Test Results					
5		1.3.E	SD-06		Compaction Test Results					
6		1.3.F	SD-03	2.3.A	Warning Tape					
7		1.3.G	SD-01		Permits Required for Excavation, Dewatering, or Backfill					
8		1.3.H	SD-01	1.4	Traffic Control Plan					
32 12 16					Asphalt Paving					
1		1.3.A	SD-03	2.1	Aggregates					
2		1.3.A	SD-03	2.2	Asphalt Materials					
3		1.3.A	SD-03	2.3	Auxiliary Materials					
4		1.3.A	SD-03	2.4	Mixes					
5		1.3.B	SD-06		Gradation Test Results					
6		1.3.C	SD-07		Qualifications of Testing Agency					
7		1.3.D	SD-02		Shop Drawings					
8		1.6.B	SD-07		Manufacturer and Testing Agency Qualifications					
9		1.6.C	SD-06		Material Test Reports					
10		1.6.D	SD-06		Field Quality-Control Reports					
32 16 13					Concrete Sidewalk, Curb and Gutters					
1		1.4.A	SD-03	2.5	Steel Reinforcement					
2		1.4.A	SD-03	2.6	Curing Materials					

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3		1.4.B	SD-03		Design Mixtures					
4		1.4.C	SD-01		Cold Weather Concreting Plan					
5		1.5.A	SD-07		Qualifications Data for Ready-Mix Manufacturer					
6		1.5.A	SD-07		Qualifications Data for Ready-Mix Testing Agency					
7		1.5.B	SD-07		Cementitious Materials Certificates					
8		1.5.B	SD-07		Steel Reinforcement and Reinforcement Accessories Certificates					
9		1.5.B	SD-07		Fiber Reinforcement Certificates					
10		1.5.B	SD-07		Admixtures Certificates					
11		1.5.B	SD-07		Curing Compounds Certificates					
12		1.5.B	SD-07		Applied Finish Materials Certificates					
13		1.5.B	SD-07		Bonding Agent or Epoxy Adhesive Certificates					
14		1.5.B	SD-07		Joint Fillers Certificates					
15		1.5.C	SD-06		Material Test Reports: Aggregates					
33 63 21					Direct Buried Steam and Condensate					
1		1.2.A	SD-03	2.3.A	Steam Piping and Fitting Insulation					
2		1.2.A	SD-03	2.3.B	Condensate Piping and Fitting Insulation					
3		1.2.B	SD-01		Application Schedule					

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