BARTLETT REGIONAL HOSPITAL (BRH)
OPERATING ROOM (OR)
VENTILATION UPGRADES

VOLUME I OF II

Contract No. E16-095

File No. 1905

ENGINEERING DEPARTMENT

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SECTION 00030 - NOTICE INVITING BIDS

OBTAINING CONTRACT DOCUMENTS. The Contract Documents are entitled:

BARTLETT REGIONAL HOSPITAL
OR VENTILATION UPGRADES
CBJ Contract No. E16-095

The Contract Documents may be obtained at the City & Borough of Juneau (CBJ) Engineering Department, 3rd Floor Marine View Center, upon payment of $25 (non-refundable) for each set of Contract Documents (including Technical Specifications and Drawings) or may be downloaded for free at the CBJ Engineering Department webpage at: www.juneau.org/engineering

PRE-BID CONFERENCE. Prospective Bidders are encouraged to attend a Pre-Bid conference of the proposed WORK, which will be conducted by the OWNER and ARCHITECT, at 10:00 a.m. on January 25, 2016, in the City and Borough of Juneau Engineering Conference Room, 3rd Floor, Marine View Center. The object of the conference is to acquaint Bidders with the bid documents and site conditions. Conference call capability will be available for the Pre-Bid meeting. Proposers intending to participate via conference call shall notify Contract Specialist in the CBJ Engineering Contracts Division, at (907) 586-0878, or Contracts@ci.juneau.ak.us by 4:30 p.m., January 22, 2016.

DESCRIPTION OF WORK. This Project consists of the installation of a 20 ton water cooled chiller and associated fittings, valves and piping, and the installation of a circulation pump, expansion tank, air/dirt separator and glycol fill tank within Mechanical Penthouse Z-2. Work will include the installation of low temperature chilled water supply and return piping and heat trace between Mechanical Penthouse Z-2 and Mechanical Penthouse Z-3, installation of low temperature chilled water supply and return piping system within Mechanical Penthouse Z-3, the replacement of duct humidifiers in Mechanical Penthouse Z-3, modifications to the existing building automation / controls system and modifications to the existing electrical distribution and heat trace systems. Work will also include the installation of balancing dampers within the existing return air and supply air ductwork located above the painted gypsum board ceilings in the occupied Operating Room corridor, and miscellaneous related Work.

COMPLETION OF WORK.

Work Description	**Completion Date**
Substantial Completion	April 21, 2016
Final Completion	May 20, 2016

DEADLINE FOR BIDS: Sealed bids must be received by the Purchasing Division **prior to 2:00 p.m., Alaska Time on February 1, 2016,** or such later time as may be announced by addendum at any time prior to the deadline. Bids will be time and date stamped by the Purchasing Division, which will establish the official time of receipt of bids. Bids will be opened immediately thereafter in the Assembly Chambers of the Municipal Building, 155 S. Seward Street, unless otherwise specified.

Bid documents delivered in person or by courier service must be delivered to:

PHYSICAL LOCATION:
City and Borough of Juneau, Purchasing Division
105 Municipal Way, Room 300
Juneau, AK 99801

Bid documents delivered by the U.S. Postal Service must be mailed to:

MAILING ADDRESS:
City and Borough of Juneau, Purchasing Division
155 South Seward Street
Juneau, AK 99801

Please affix the label below to outer envelope in the lower left hand corner.

IMPORTANT NOTICE TO BIDDER

To submit your Bid:

1. Print your company name and address on the upper left corner of your envelope.
2. **Complete this label and place it on the lower left corner of your envelope.**

S E A L E D

BID NUMBER:
E16-095

SUBJECT:
BRH OR Ventilation Upgrades

DEADLINE DATE:
_____
PRIOR TO 2:00PM ALASKA TIME

B I D

Mailing/delivery times to Alaska may take longer than other areas of the U.S. Late bids will not be accepted and will be returned.

SITE OF WORK. The site of the WORK is Bartlett Regional Hospital at 3260 Hospital Drive, Juneau, Alaska.

BIDDING, CONTRACT, or TECHNICAL QUESTIONS. All communications relative to this WORK, prior to opening Bids, shall be directed to the following:

Greg Smith, Contract Administrator
CBJ Engineering Department, 3rd Floor, Marine View Center
greg.smith@juneau.org
Telephone: (907) 586-0873
Fax: (907) 586-4530

BID SECURITY. Each Bid shall be accompanied by a certified or cashier's check or Bid Bond, in the amount of 5% percent of the Bid, payable to the City and Borough of Juneau, Alaska, as a guarantee that the Bidder, if its Bid is accepted, will promptly execute the Agreement. A Bid shall not be considered unless one of the forms of Bidder's security is enclosed with it.

SECTION 00030 - NOTICE INVITING BIDS

CONTRACTOR'S LICENSE. All contractors are required to have a current Alaska Contractor's License, prior to submitting a Bid, and a current Alaska Business License prior to award.

BID TO REMAIN OPEN. The Bidder shall guarantee the Bid for a period of 90 Days from the date of Bid opening. Any component of the Bid may be awarded anytime during the 90 Days.

OWNER'S RIGHTS RESERVED. The OWNER reserves the right to reject any or all Bids, to waive any informality in a Bid, and to make award to the lowest responsive, responsible Bidder as it may best serve the interests of the OWNER.

OWNER: City and Borough of Juneau

By: _____ Date 1-11-16
Greg Smith, Contract Administrator FOR

END OF SECTION

SECTION 00100 - INSTRUCTIONS TO BIDDERS

1.0 DEFINED TERMS. Terms used in these Instructions to Bidders and the Notice Inviting Bids, which are defined in the General Conditions, have the meanings assigned to them in the General Conditions. The term "Bidder" means one who submits a Bid directly to the OWNER, as distinct from a sub-bidder, who submits a Bid to a Bidder.

2.0 INTERPRETATIONS AND ADDENDA.

A. INTERPRETATIONS. All questions about the meaning or intent of the Contract Documents are to be directed to the Engineering Contracts Administrator. Interpretations or clarifications considered necessary by the Engineering Contracts Administrator in response to such questions will be issued by Addendum, mailed, faxed, or delivered to all parties recorded by the Engineering Contracts Administrator, or OWNER, as having received the Contract Documents. Questions received less than seven Days prior to the Deadline for Bids may not be answered. Only questions answered by formal written Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect.

B. ADDENDA. Addenda may be issued to modify the Contract Documents as deemed advisable by the OWNER. Addenda may be faxed or, if addendum format warrants, addenda may be posted to the CBJ Engineering Department website. In any event, notification of addendum issuance will be faxed to planholders. Hard copies are available upon request. The OWNER will make all reasonable attempts to ensure that all planholders receive notification of Addenda, however, it is strongly recommended by the OWNER that bidders independently confirm the contents, number, and dates of each Addendum prior to submitting a Bid.

3.0 FAIR COMPETITION. More than one Bid from an individual, firm, partnership, corporation, or association under the same or different names will not be considered. If the OWNER believes that any Bidder is interested in more than one Bid for the WORK contemplated, all Bids in which such Bidder is interested will be rejected. If the OWNER believes that collusion exists among the Bidders, all Bids will be rejected.

4.0 RESPONSIBILITY OF BIDDERS. Only responsive Bids from responsible Bidders will be considered. A Bid submitted by a Bidder determined to be not responsible may be rejected. The OWNER may find a bidder to be not responsible for any one of the following reasons, but is not limited in its responsibility analysis to the following factors:

A. Evidence of bid rigging or collusion;

B. Fraud or dishonesty in the performance of previous contracts;

C. Record of integrity;

D. More than one bid for the same work from an individual, firm, or corporation under the same or different name;

E. Unsatisfactory performance on previous or current contracts;

F. Failure to pay, or satisfactorily settle, all bills due for labor and material on previous contracts;

G. Uncompleted work that, in the judgment of the OWNER, might hinder or prevent the bidder's prompt completion of additional work, if awarded;

H. Failure to reimburse the OWNER for monies owed on any previous contracts;

I. Default under previous contracts;

J. Failure to comply with any qualification requirements of the OWNER; special standards for responsibility, if applicable, will be specified. These special standards establish minimum standards or experience required for a responsible Bidder on a specific contract;

K. Engaging in any activity that constitutes a cause for debarment or suspension under the CBJ Procurement Code 53.50 or submitting a bid during a period of debarment;

L. Lack of skill, ability, financial resources, or equipment required to perform the contract; or

M. Lack of legal capacity to contract.

N. Bidders must be registered as required by law and in good standing for all amounts owned to the OWNER per Paragraph 21.0 of this Section.

O. Failure to submit a complete Subcontractor Report as required in section Section 00360 – Subcontractor Report.

Nothing contained in this section deprives the OWNER of its discretion in determining the lowest responsible bidder. Before a Bid is considered for award, a Bidder may be requested to submit information documenting its ability and competency to perform the WORK, according to general standards of responsibility and any special standards which may apply. It is Bidder's responsibility to submit sufficient, relevant, and adequate information. OWNER will make its determination of responsibility and has no obligation to request clarification or supplementary information.

5.0 NON-RESPONSIVE BIDS. Only responsive Bids will be considered. Bids may be considered non-responsive and may be rejected. Some of the reasons a Bid may be rejected for being non-responsive are:

A. If a Bid is received by the CBJ Purchasing Division after the Deadline for Bids.

B. If the Bid is on a form other than that furnished by the OWNER, or legible copies thereof; or if the form is altered or any part thereof is detached; or if the Bid is improperly signed.

C. If there are unauthorized additions, conditional or alternate Bids, or irregularities of any kind which may tend to make the bid incomplete, indefinite, ambiguous as to its meaning, or in conflict with the OWNER's Bid document.

D. If the Bidder adds any unauthorized conditions, limitations, or provisions reserving the right to accept or reject any award, or to enter into a contract pursuant to an award. This does not exclude a Bid limiting the maximum gross amount of awards acceptable to any one Bidder at any one Bid opening, provided that any selection of awards will be made by the OWNER.

E. If the Bid does not contain a Unit Price for each pay item listed, except in the case of authorized alternate pay items.

F. If the Bidder has not acknowledged receipt of each Addendum.

G. If the Bidder fails to furnish an acceptable Bid guaranty with the Bid.

H. If any of the Unit Prices Bid are excessively unbalanced (either above or below the amount of a reasonable Bid) to the potential detriment of the OWNER.

I. If a Bid modification does not conform to Article 15.0 of this Section.

6.0 BIDDER'S EXAMINATION OF CONTRACT DOCUMENTS AND SITE. It is the responsibility of each Bidder before submitting a Bid:

A. To examine thoroughly the Contract Documents, and other related data identified in the Bidding documents (including "technical data" referred to below):

1. To visit the site to become familiar with and to satisfy the Bidder as to the general and local conditions that may affect cost, progress, or performance, of the WORK,
2. To consider federal, state and local laws and regulations that may affect cost, progress, or performance of the WORK,
3. To study and carefully correlate the Bidder's observations with the Contract Documents, and other related data; and
4. To notify the ARCHITECT of all conflicts, errors, or discrepancies in or between the Contract Documents and such other related data.

7.0 REFERENCE IS MADE TO THE SUPPLEMENTARY GENERAL CONDITIONS FOR IDENTIFICATION OF:

A. Those reports of explorations and tests of subsurface conditions at the site which have been utilized by the Architect of Record in the preparation of the Contract Documents. The Bidder may rely upon the accuracy of the technical data contained in such reports, however, the interpretation of such technical data, including any interpolation or extrapolation thereof, together with non-technical data, interpretations, and opinions contained therein or the completeness thereof is the responsibility of the Bidder.

B. Those Drawings of physical conditions in or relating to existing surface and subsurface conditions (except underground utilities) which are at or contiguous to the site have been utilized by the Architect of Record in the preparation of the Contract Documents. The Bidder may rely upon the accuracy of the technical data contained in such Drawings, however, the interpretation of such technical data, including any interpolation or extrapolation thereof, together with nontechnical data, interpretations, and opinions contained in such Drawings or the completeness thereof is the responsibility of the Bidder.

C. Copies of such reports and Drawings will be made available by the OWNER to any Bidder on request if said reports and Drawings are not bound herein. Those reports and Drawings are not part of the Contract Documents, but the technical data contained therein upon which the Bidder is entitled to rely, as provided in Paragraph SGC-4.2 of the Supplementary General Conditions, are incorporated herein by reference.

D. Information and data reflected in the Contract Documents with respect to underground utilities at or contiguous to the site is based upon information and data furnished to the OWNER and the Architect of Record by the owners of such underground utilities or others, and the OWNER does not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary General Conditions, or in Section 01530 - Protection and Restoration of Existing Facilities of the General Requirements.

E. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, underground utilities and other physical conditions, and possible changes in the Contract Documents due to differing conditions appear in Paragraphs 4.2, 4.3, and 4.4 of the General Conditions.

F. Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests, and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface, and underground utilities) at or contiguous to the site or otherwise which may affect cost, progress, or performance of the WORK and which the Bidder deems necessary to determine its Bid for performing the WORK in accordance with the time, price, and other terms and conditions of the Contract Documents.

G. On request in advance, the OWNER will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and shall clean up and restore the site to its former condition upon completion of such explorations.

H. The lands upon which the WORK is to be performed, rights-of-way and easements for access thereto and other lands designated for use by the CONTRACTOR in performing the WORK are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by the CONTRACTOR. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by the OWNER unless otherwise provided in the Contract Documents.

I. The submission of a Bid will constitute an incontrovertible representation by the Bidder that the Bidder has complied with every requirement of Article 6.0, "Bidder's Examination of Contract Documents and Site" herein, that without exception the Bid is premised upon performing the WORK required by the Contract Documents and such means, methods, techniques, sequences, or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the WORK.

8.0 BID FORM.

A. The Bid shall be made on the Bid Schedule(s) bound herein, or on the yellow Bid packet provided, or on legible and complete copies thereof, and shall contain the following: Sections 00300, 00310, the required Bid Security, and any other documents required in Section 00300 – Bid.

B. All blanks on the Bid Form and Bid Schedule must be completed in ink or typed.

C. Bids by corporations must be executed in the corporate name by the president, a vice-president (or other corporate officer). The corporate address and state of incorporation must appear below the signature.

D. Bids by partnerships must be executed in the partnership name and be signed by a managing partner, and the official address of the partnership must appear below the signature.

E. The Bidder's Bid must be signed. All names must be printed or typed below the signature.

F. The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid form. Failure to acknowledge Addenda may render Bid non-responsive and may cause its rejection.

G. The address to which communications regarding the Bid are to be directed must be shown.

9.0 QUANTITIES OF WORK. The quantities of WORK, or material, stated in Unit Price items of the Bid are supplied only to give an indication of the general scope of the WORK; the OWNER does not expressly or by implication agree that the actual amount of WORK, or material, will correspond therewith, and reserves the right after award to increase or decrease the amount of any Unit Price item of the WORK by an amount up to and including 25 percent of any Bid item, without a change in the Unit Price, and shall include the right to delete any Bid item in its entirety, or to add additional Bid items up to and including an aggregate total amount not to exceed 25 percent of the Contract Price (see Section 00700 - General Conditions, Article 10 Changes In the WORK).

10.0 SUBSTITUTE OR "OR-EQUAL" ITEMS. The procedure for the submittal of substitute or "or-equal" products is specified in Section 013300 – Submittal Procedures.

11.0 SUBMISSION OF BIDS. The Bid shall be delivered by the time and to the place stipulated in Section 00030 - Notice Inviting Bids. It is the Bidder's sole responsibility to see that its Bid is received in proper time. Oral, telegraphic, emailed, or faxed Bids will not be considered. The envelope enclosing the sealed Bids shall be plainly marked in the upper left-hand corner with the name and address of the Bidder and shall also include the label included in Section 00030 – Notice Inviting Bids. The Bid Security shall be enclosed in the same envelope with the Bid

12.0 BID SECURITY, BONDS, AND INSURANCE. Each Bid shall be accompanied by a certified, or cashier's check, or approved Bid Bond in an amount of at least 5 percent of the total Bid price. The "total Bid price" is the amount of the Base Bid, plus the amount of alternate Bids, if any, which total to the maximum amount for which the CONTRACT could be awarded. Said check or Bond shall be made payable to the OWNER and shall be given as a guarantee that the Bidder, if offered the WORK, will enter into an Agreement with the OWNER, and will furnish the necessary insurance certificates, Payment Bond, and Performance Bond; each of said Bonds, if required, and insurance amounts shall be as stated in the Supplementary General Conditions. In case of refusal or failure to enter into said Agreement, the check or Bid Bond, as the case may be, may be forfeited to the OWNER. If the Bidder elects to furnish a Bid Bond as its Bid security, the Bidder shall use the Bid Bond form bound herein, or one conforming substantially to it in form. Bid Bonds must be accompanied by a legible Power of Attorney.

13.0 RETURN OF BID SECURITY. The OWNER will return all Bid security checks (certified or cashier's) accompanying such of the Bids as are not considered in making the award. All other Bid securities will be held until the Agreement has been executed. Following execution of the Agreement, all other Bid security checks will be returned to the respective Bidders whose Bids they accompanied and Bid security bonds will be appropriately discarded.

14.0 DISCREPANCIES IN BIDS. In the event there is more than one Pay Item in a Bid Schedule, the Bidder shall furnish a price for all Pay Items in the schedule, and failure to do so may render the Bid non-responsive and cause its rejection. In the event there are Unit Price Pay Items in a Bid Schedule and the "amount" indicated for a Unit Price Bid Item does not equal the product of the Unit Price and quantity, the Unit Price shall govern and the amount will be corrected accordingly, and the Bidder shall be bound by said correction. In the event there is more than one Pay Item in a Bid Schedule and the total indicated for the schedule does not agree with the sum of the prices Bid on the individual items, the prices Bid on the individual items shall govern and the total for the schedule will be corrected accordingly, and the Bidder shall be bound by said correction.

15.0 BID MODIFICATIONS AND UNAUTHORIZED ALTERNATIVE BIDS.

A. Any bidder may deliver a modification to a bid in person, by mail or fax (907-586-4561), provided that such modification is received by the Purchasing Division no later than the deadline for bids. Modifications will be time and date stamped by the Purchasing Division, which will establish the official time of receipt of the modification. The modification must not reveal the bid price but should be in the form of an addition or subtraction or other modification so that the final prices will not be known until the sealed bid is opened.

The Bid modifications shall be provided on the **Bid Modification Form** located at the end of this Section. Submittal of any other form by the vendor may deem the modification unacceptable by the OWNER **A mail or fax modification should not reveal the Bid price but should provide the addition or subtraction or other modification so that the final prices will not be known by the City and Borough until the sealed Bid is opened**. Submitted Modification forms shall include the modification to the unit price or lump sum amount of each pay item modified.

FAX DISCLAIMER: It is the responsibility of the bidder to submit modifications in a timely manner. Bidders' use of a fax machine to modify their bid shall be at bidders' sole risk. The Purchasing Division will attempt to keep the fax machine in good working order but will not be responsible for bid modifications that are late due to mechanical failure, a busy fax machine, or any other cause arising from bidder's use of a fax machine, even if bidder submits a transmission report or provides other confirmation indicating that the bidder transmitted a bid modification prior to the deadline. The City will not be responsible for its failure to receive the modification whether such failure is caused by equipment or human error, or otherwise. Bidders are therefore strongly encouraged to confirm receipt of their bid modification with the Purchasing Division (907-586-5258) prior to deadline.

B. Conditioned bids, limitations, or provisos attached to the Bid or bid modification will render it unauthorized and cause its rejection as being non-responsive. The completed Bid forms shall be without interlineations, alterations, or erasures in the printed text. All changes shall be initialed by the person signing the Bid. Alternative Bids will not be considered unless called for.

16.0 WITHDRAWAL OF BID. Prior to the Deadline for Bids, the Bid may be withdrawn by the Bidder by means of a written request, signed by the Bidder or its properly authorized representative. Such written request must be delivered to the place stipulated in the Notice Inviting Bids for receipt of Bids.

17.0 AWARD OF CONTRACT.

A. Award of a contract, if it is awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Technical Specifications and will be made to the lowest responsive, responsible Bidder whose Bid complies with all the requirements prescribed. Unless otherwise specified, any such award will be made within the period stated in the Notice Inviting Bids that the Bids are to remain open. Unless otherwise indicated, a single award will be made for all the Bid items in an individual Bid Schedule.

B. If the OWNER has elected to advertise this Project with a Base Bid and Alternates, the OWNER may elect to award the contract for the Base Bid, or the Base Bid in combination with one or more Alternates selected by the OWNER. In either case, award shall be made to the responsive, responsible bidder offering the lowest total Bid for the WORK to be awarded.

18.0 EXECUTION OF AGREEMENT.

A. All Bids of value greater than $1,000,000 must be approved by the CBJ Assembly. After the CBJ Assembly has approved the award and after the Bid protest period, the OWNER will issue a Notice of Intent to Award to the approved Bidder. The Bidder to whom award is made shall execute a written Agreement with the OWNER on the Agreement form, Section 00500, collect insurance, and shall furnish all certificates and Bonds required by the Contract Documents within 10 Days (calendar) from the date of the Notice of Intent to Award letter.

B. Failure or refusal to enter into the Agreement as herein provided or to conform to any of the stipulated requirements in connection therewith shall be just cause for annulment of the award and forfeiture of the Bid security. If the lowest responsive, responsible Bidder refuses or fails to execute the Agreement, the OWNER may award the contract to the second lowest responsive, responsible Bidder. If the second lowest responsive, responsible Bidder refuses or fails to execute the Agreement, the OWNER may award the contract to the third lowest responsive, responsible Bidder. On the failure or refusal of such second or third lowest Bidder to execute the Agreement, each such Bidder's Bid securities shall be likewise forfeited to the OWNER.

19.0 LIQUIDATED DAMAGES. Provisions for liquidated damages if any, are set forth in Section 00500 - Agreement.

20.0 FILING A PROTEST.

A. A Bidder may protest the proposed award of a competitive sealed Bid by the City and Borough of Juneau. The protest shall be executed in accordance with CBJ Ordinance 53.50.062 PROTESTS and CBJ Ordinance 53.50.080 ADMINISTRATION OF PROTEST. The entire text of the CBJ Purchasing Ordinance can be accessed at the CBJ website, *http://www.juneau.org/law/code/code.php*, or call the CBJ Purchasing Division at (907) 586-5258 for a copy of the ordinance.

B. Late protests shall not be considered by the CBJ Purchasing Officer.

21.0 CONTRACTOR'S GOOD STANDING WITH CBJ FINANCE DEPARTMENT: Contractors must be in good standing with the CBJ prior to award, and prior to any contract renewals, and in any event no later than ***seven business days*** following notification by the CBJ of intent to award. **Good standing** means: all amounts owed to the CBJ are current and the Contractor is not delinquent with respect to any taxes, fees, assessment, or other monies due and owed the CBJ, or a Confession of Judgment has been executed and the Contractor is in compliance with the terms of any stipulation associated with the Confession of Judgment, including being current as to any installment payments due; and Contractor is current in all CBJ reporting obligations (such as sales tax registration and reporting and business personal property declarations). Failure to meet these requirements may be cause for rejection of your bid. To determine if your business is in good standing, or for further information, contact the CBJ Finance Department's Sales Tax Division at (907) 586-5265 for sales tax issues, Assessor's Office at (907)586-0930 for business personal property issues, or Collections Division at (907) 586-5268 for all other accounts.

22.0 PERMITS AND LICENSES. The CONTRACTOR is responsible for all WORK associated with meeting any local, state, and/or federal permit and licensing requirements.

CITY AND BOROUGH OF JUNEAU
PURCHASING DIVISION
FAX NO. 907-586-4561

BID MODIFICATION FORM

Modification Number: _____

Note: All modifications shall be made to the original bid amount(s). If more than one Modification form is submitted by any one bidder, changes from all Modification forms submitted will be combined and applied to the original bid. Changes to the modified Bid amounts will be calculated by the OWNER.

PAY ITEM NO.	PAY ITEM DESCRIPTION	MODIFICATIONS TO UNIT PRICE OR LUMP SUM (*indicate* +/-)

Base Bid Total Increase or Decrease: $_____

PAY ITEM No.	ALTERNATE PAY ITEM DESCRIPTION	MODIFICATIONS TO UNIT PRICE OR LUMP SUM (*indicate* +/-)

Alternate Total Increase or Decrease: $_____

_____
Name of Bidding Firm

_____
Responsible Party Signature

_____
Printed Name (must be an authorized signatory for Bidding Firm)

END OF SECTION

SECTION 00300 - BID

BID TO: THE CITY AND BOROUGH OF JUNEAU

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with the OWNER in the form included in the Contract Documents (as defined in Article 7 of Section 00500 - Agreement) to perform the WORK as specified or indicated in said Contract Documents entitled

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CBJ Contract No. E16-095

2. Bidder accepts all of the terms and conditions of the Contract Documents, including without limitation those in the "Notice Inviting Bids" and "Instructions to Bidders," dealing with the disposition of the Bid Security.

3. This Bid will remain open for the period of time stated in the "Notice Inviting Bids" unless otherwise required by law. Bidder will enter into an Agreement within the time and in the manner required in the "Notice Inviting Bids" and the "Instructions to Bidders," and will furnish insurance certificates, Payment Bond, Performance Bond, and any other documents as may be required by the Contract Documents.

4. Bidder has familiarized itself with the nature and extent of the Contract Documents, WORK, site, locality where the WORK is to be performed, the legal requirements (federal, state and local laws, ordinances, rules, and regulations), and the conditions affecting cost, progress or performance of the WORK and has made such independent investigations as Bidder deems necessary.

5. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any person, firm or corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

6. To all the foregoing, and including all Bid Schedule and information required of Bidder contained in this Bid Form, said Bidder further agrees to complete the WORK required under the Contract Documents within the Contract Time stipulated in said Contract Documents, and to accept in full payment therefore the Contract Price based on the total bid price(s) named in the aforementioned Bid Schedule.

7. Bidder has examined copies of all the Contract Documents including the following Addenda (receipt of all of which is hereby acknowledged by the Undersigned):

Addenda No.	Date Issued	Addenda No.	Date Issued

Give number and date of each addenda above. Failure to acknowledge receipt of all Addenda may cause the Bid to be non-responsive and may cause its rejection.

8. The Bidder has read this Bid and agrees to the conditions as stated herein by signing his/her signature in the space provided below.

Dated: _____	Bidder: _____ (Company Name)
Alaska CONTRACTOR's Business License No: _____	By: _____ (Signature)
Alaska CONTRACTOR's License No: _____	Printed Name: _____
Telephone No: _____	Title: _____
Fax No: _____	Address: _____ (Street or P.O. Box)
Email: _____	_____ (City, State, Zip)

9. TO BE CONSIDERED, ALL BIDDERS MUST COMPLETE AND INCLUDE THE FOLLOWING AT THE TIME OF THE DEADLINE FOR BIDS:

- Bid, Section 00300 (includes addenda receipt statement)
- Completed Bid Schedule, Section 00310
- Bid Security (Bid Bond, Section 00320, or by a certified or cashier's check as stipulated in the Notice Inviting Bids, Section 00030)

10. The apparent low Bidder is required to complete and submit the following documents by 4:30 p.m. on the ***fifth business day*** following the date of the Posting Notice.

- Subcontractor Report, Section 00360

The apparent low Bidder who fails to submit a completed Subcontractor Report within the time specified in Section 00360 – Subcontractor Report will be found to be not a responsible Bidder and may be required to forfeit the Bid security. The OWNER will then consider the next lowest Bidder for award of the contract.

11. The successful Bidder will be required to submit, within ***ten Days (calendar)*** after the date of the "Notice of Intent to Award" letter, the following executed documents:

- Agreement Forms, Section 00500
- Performance Bond, Section 00610
- Payment Bond, Section 00620
- Certificates of Insurance, (CONTRACTOR) Section 00700 and Section 00800

END OF SECTION

SECTION 00310 - BID SCHEDULE

Bid Schedule for construction of **E16-095 named, BRH OR VENTILATION UPGRADES**, in accordance with the Contract Documents.

TOTAL BID - Furnish all labor, equipment and materials for the installation of a 20 ton water cooled chiller and associated fittings, valves and piping, and perform all WORK as described in these Contract Documents.

TOTAL BID **$**_____

(Price in Figures)

Date: _____ **Bidder:** _____

(Company Name)

END OF SECTION

SECTION 00320 - BID BOND

KNOW ALL PERSONS BY THESE PRESENTS, that_____

_____ as Principal, and _____

as Surety, are held and firmly bound unto **THE CITY AND BOROUGH OF JUNEAU** hereinafter called "OWNER," in the sum of _____

_____ dollars, (not less than five percent of the total amount of the Bid) for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, said Principal has submitted a Bid to said OWNER to perform the WORK required under the Bid Schedule of the OWNER's Contract Documents entitled

BARTLETT REGIONAL HOSPITAL
OR VENTILATION UPGRADES
CBJ Contract No. E16-095

NOW THEREFORE, if said Principal is awarded a contract by said OWNER and, within the time and in the manner required in the "Notice Inviting Bids" and the "Instructions to Bidders" enters into a written Agreement on the form of Agreement bound with said Contract Documents, furnishes the required certificates of insurance, and furnishes the required Performance Bond and Payment Bond, then this obligation shall be null and void, otherwise it shall remain in full force and effect. In the event suit is brought upon this bond by said OWNER and OWNER prevails, said Surety shall pay all costs incurred by said OWNER in such suit, including a reasonable attorney's fee to be fixed by the court.

SIGNED AND SEALED, this _____ day of _____, 20_____.

(SEAL)_____	(SEAL)_____
(Principal)	(Surety)
By:_____	By:_____
(Signature)	(Signature)

END OF SECTION

SECTION 00360 - SUBCONTRACTOR REPORT

LIST OF SUBCONTRACTORS (AS 36.30.115)

The apparent low Bidder must submit a list of Subcontractors that the Bidder proposes to use in the performance of this contract ***on the fifth business day*** following the Posting Notice of Bids. If the fifth day falls on a weekend or holiday, the report is due by close of business on the next business Day following the weekend or holiday. The Subcontractor Report list must include each Subcontractor's name, address, location, evidence of valid Alaska Business License, and valid Alaska Contractor's Registration under AS 08.18. ***If no Subcontractors are to be utilized in the performance of the WORK, write in ink or type "NONE" on line (1) below***

	SUBCONTRACTOR ADDRESS	[1] AK Contractor License No. [2] AK Business License No.	[1] Contact Name [2] Phone No.	Type of Work	Contract Amount	✓ if DBE
1.		[1] [2]			$	☐
2.		[1] [2]			$	☐
3.		[1] [2]			$	☐
4.		[1] [2]			$	☐

I certify that the above listed Alaska Business License(s) and CONTRACTOR Registration(s), if applicable, were valid at the time Bids were opened for this Project.

_____
CONTRACTOR, Authorized Signature

_____
CONTRACTOR, Printed Name

_____
COMPANY

A. A Bidder may replace a listed Subcontractor if the Subcontractor:

1. fails to comply with AS 08.18;
2. files for bankruptcy or becomes insolvent;
3. fails to execute a contract with the Bidder involving performance of the WORK for which the Subcontractor was listed and the Bidder acted in good faith;
4. fails to obtain bonding;
5. fails to obtain insurance acceptable to the OWNER;
6. fails to perform the contract with the Bidder involving work for which the Subcontractor was listed;
7. must be substituted in order for the CONTRACTOR to satisfy required state and federal affirmative action requirements;
8. refuses to agree or abide with the Bidder's labor agreement; or
9. is determined by the OWNER not to be responsible.
10. is not in "Good Standing" with the OWNER as required in Article 21.0 in Section 00100 – Instructions to Bidders.

B. If a Bidder fails to list a Subcontractor or lists more than one Subcontractor for the same portion of WORK, the Bidder shall be considered to have agreed to perform that portion of WORK without the use of a Subcontractor and to have represented the Bidder to be qualified to perform that WORK.

C. A Bidder who attempts to circumvent the requirements of this section by listing as a Subcontractor another contractor who, in turn, sublets the majority of the WORK required under the contract violates this section.

D. If a contract is awarded to a Bidder who violates this section, the OWNER may:

1. cancel the contract; or
2. after notice and a hearing, assess a penalty on the Bidder in an amount that does not exceed 10 percent of the value of the subcontract at issue.

E. On the Subcontractor Report, the apparent low Bidder must list any Subcontractors anticipated to perform WORK with a value of greater than one-half of one percent of the intended award amount, or $2,000, whichever is less.

F. An apparent low Bidder who fails to submit a completed Subcontractor Report within the time specified in this section may be found to be not a responsible Bidder and may be required to forfeit the Bid security. The OWNER will then consider the next lowest Bidder for award of the contract.

END OF SECTION

SECTION 00500 - AGREEMENT

THIS AGREEMENT is between THE CITY AND BOROUGH OF JUNEAU (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR) OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK.

CONTRACTOR shall complete the WORK as specified or as indicated under the Bid Schedule of the OWNERS Contract Documents **Contract E16-095, Bartlett Regional Hospital OR Ventilation Upgrades**

The WORK is generally described as follows: This Project consists of the installation of a 20 ton water cooled chiller and associated fittings, valves and piping, and the installation of a circulation pump, expansion tank, air/dirt separator and glycol fill tank within Mechanical Penthouse Z-2. Work will include the installation of low temperature chilled water supply and return piping and heat trace between Mechanical Penthouse Z-2 and Mechanical Penthouse Z-3, installation of low temperature chilled water supply and return piping system within Mechanical Penthouse Z-3, the replacement of duct humidifiers in Mechanical Penthouse Z-3, modifications to the existing building automation / controls system and modifications to the existing electrical distribution and heat trace systems. Work will also include the installation of balancing dampers within the existing return air and supply air ductwork located above the painted gypsum board ceilings in the occupied Operating Room corridor, and miscellaneous related Work.

The WORK to be paid under this contract shall include the following: Total Bid as shown in Section 00310 - Bid Schedule.

ARTICLE 2. CONTRACT COMPLETION TIME.

Work Description	**Completion Date**
Substantial Completion	April 21, 2016
Final Completion	May 20, 2016

ARTICLE 3. DATE OF AGREEMENT

The date of this agreement will be the date of the last signature on page three of this section.

ARTICLE 4. LIQUIDATED DAMAGES.

OWNER and the CONTRACTOR recognize that time is of the essence of this Agreement and that the OWNER will suffer financial loss if the WORK is not completed within the time specified in Article 2 herein, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. They also recognize the delays, expense, and difficulties involved in proving in a legal proceeding the actual damages suffered by the OWNER if the WORK is not completed on time. Accordingly, instead of requiring any such proof, the OWNER and the CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) the CONTRACTOR shall pay the OWNER **$400** for each Day that expires after the completion time(s) specified in Article 2 herein. The amount of liquidated damages specified above is agreed to be a reasonable estimate based on all facts known as of the date of this Agreement.

ARTICLE 5. CONTRACT PRICE.

OWNER shall pay CONTRACTOR for completion of the WORK in accordance with the Contract Documents in current funds the amount set forth in the Bid Schedule. The CONTRACTOR agrees to accept as full and

complete payment for all WORK to be done in this contract for: **CBJ Contract E16-095, Bartlett Regional Hospital OR Ventilation Upgrades,** those Lump Sum amounts as set forth in the Bid Schedule in the Contract Documents for this Project.

The total amount of this contract shall be _____ ($_____), except as adjusted in accordance with the provisions of the Contract Documents.

ARTICLE 6. PAYMENT PROCEDURES.

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by the ARCHITECT as provided in the General Conditions.

Progress payments will be paid in full in accordance with Article 14 of the General Conditions until ninety (90) percent of the Contract Price has been paid. The remaining ten (10) percent of the Contract Price may be retained, in accordance with applicable Alaska State Statutes, until final inspection, completion, and acceptance of the Project by the OWNER.

ARTICLE 7. CONTRACT DOCUMENTS.

The Contract Documents which comprise the entire Agreement between OWNER and CONTRACTOR concerning the WORK consist of this Agreement (pages 00500-1 to 00500-6, inclusive) and the following sections of the Contract Documents:

- Table of Contents (pages 00030-1 to 00030-2, inclusive).
- Notice Inviting Bids (pages 00030-1 to 00030-3, inclusive).
- Instructions to Bidders (pages 00100-1 to 00100-9, inclusive).
- Bid (pages 00300-1 to 00300-2, inclusive).
- Bid Schedule (pages 00310-1, inclusive).
- Bid Bond (page 00320-1, inclusive) or Bid Security.
- Subcontractor Report (pages 00360-1 to 00360-2, inclusive).
- Performance Bond (pages 00610-1 to 00610-2, inclusive).
- Payment Bond (pages 00620-1 to 00620-2, inclusive).
- Insurance Certificate(s).
- General Conditions (pages 00700-1 to 00700-44, inclusive).
- Supplementary General Conditions (pages 00800-1 to 00800-6, inclusive).
- Alaska Labor Standards, Reporting, and Prevailing Wage Determination (page 00830-1).
- Technical Specifications as listed in the Table of Contents.
- Drawings consisting of 16 sheets, as listed in the Table of Contents.
- Addenda numbers _____ to _____, inclusive.
- Change Orders which may be delivered or issued after the Date of the Agreement and which are not attached hereto.

There are no Contract Documents other than those listed in this Article 7. The Contract Documents may only be amended by Change Order as provided in Paragraph 3.3 of the General Conditions.

ARTICLE 8. MISCELLANEOUS.

Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.

No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents. This Agreement shall be governed by the laws of the State of Alaska. Jurisdiction shall be in the State of Alaska, First Judicial District.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have caused this Agreement to be executed on the date listed below signed by OWNER.

OWNER:	**CONTRACTOR:**
City and Borough of Juneau	_____ (Company Name)
_____ (Signature)	_____ (Signature)
By: Kimberly A. Kiefer, City & Borough Manager (Printed Name)	By: _____ (Printed Name, Authority or Title)
Date: _____	Date: _____ (CONTRACTOR Signature Date)
OWNER's address for giving notices:	CONTRACTOR's address for giving notices:
155 South Seward Street	_____
Juneau, Alaska 99801	_____
907-586-0873 907-586-4530 (Telephone) (Fax)	_____ (Telephone) (Fax)
	_____ (E-mail address)
	CONTRACTOR License No. _____

CERTIFICATE
(if Corporation)

STATE OF)
) SS:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the Board of Directors of the

_____a corporation existing under the laws of

the State of_____, held on _____, 20____, the following resolution was duly passed and adopted:

> "RESOLVED, that _____, as _____ President of the Corporation, be and is hereby authorized to **execute the Agreement** with the CITY AND BOROUGH OF JUNEAU and this corporation and that the execution thereof, attested by the Secretary of the Corporation, and with the Corporate Seal affixed, shall be the official act and deed of this Corporation."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the

corporation this _____ day of _____, 20____.

Secretary

(SEAL)

CERTIFICATE
(if Partnership)

STATE OF)
) SS:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the Partners of the

_____ a partnership existing under the laws of the State

of _____, held on _____, 20___, the following resolution was duly passed and adopted:

"RESOLVED, that _____, as _____ of the Partnership, be and is hereby authorized to **execute the Agreement** with the CITY AND BOROUGH OF JUNEAU and this partnership and that the execution thereof, attested by the _____shall be the official act and deed of this Partnership."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this _____, day of _____, 20_____.

Secretary

(SEAL)

CERTIFICATE
(if Joint Venture)

STATE OF)
) SS:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the Principals of the

_____ a joint venture existing under the laws of the

State of _____, held on _____, 20___, the following resolution was duly passed and adopted:

"RESOLVED, that _____, as _____ of the Joint Venture, be and is hereby authorized to **execute the Agreement** with the CITY AND BOROUGH OF JUNEAU and this joint venture and that the execution thereof, attested by the _____ shall be the official act and deed of this Joint Venture."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand this _____, day of _____, 20___.

Secretary

(SEAL)

END OF SECTION

SECTION 00610 - PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: That we _____
(Name of CONTRACTOR)
a _____
(Corporation, Partnership, Individual)
hereinafter called "Principal" and _____
(Surety)
of _____, State of _____ hereinafter called the "Surety", are held and firmly bound to the CITY AND BOROUGH of JUNEAU, ALASKA hereinafter called "OWNER", for the penal sum
(Owner)` (City and State)
of _____dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the CONTRACTOR has entered into a certain contract with the OWNER, the effective date of which is (CBJ Contracts Office to fill in effective date) _____, a copy of which is hereto attached and made a part hereof for the construction of:

BARTLETT REGIONAL HOSPITAL
OR VENTILATION UPGRADES
CBJ Contract No. E16-095

NOW, THEREFORE, if the Principal shall truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof, which may be granted by the OWNER, with or without notice to the Surety, and if it shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the OWNER and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

BARTLETT REGIONAL HOSPITAL
OR VENTILATION UPGRADES
CBJ Contract No. E16-095

IN WITNESS WHEREOF, this instrument is issued in two (2) identical counterparts, each one of which shall be deemed an original.

CONTRACTOR:

By: _____
(Signature)

_____
(Printed Name)

_____
(Company Name)

_____
(Mailing Address)

_____
(City, State, Zip Code)

SURETY:

By: _____ Date Issued: _____
(Signature of Attorney-in-Fact)

_____
(Printed Name)

_____
(Company Name)

_____
(Mailing Address)

_____
(City, State, Zip Code)

(Affix SURETY'S SEAL)

NOTE: If CONTRACTOR is Partnership, <u>all</u> Partners must execute bond.

SECTION 00620 - PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: That we _____
(Name of CONTRACTOR)

_____ a _____
(Corporation, Partnership, Individual)

hereinafter called "Principal" and _____
(Surety)

of _____, State of _____ hereinafter called the "Surety," are held and

firmly bound to the CITY AND BOROUGH of JUNEAU, ALASKA hereinafter called "OWNER," for the
(Owner) (City and State)

penal sum of _____ Dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that Whereas, the CONTRACTOR has entered into a certain contract with the OWNER, the effective date of which is (CBJ Contracts Office to fill in effective date) _____, a copy of which is hereto attached and made a part hereof for the construction of:

BARTLETT REGIONAL HOSPITAL
OR VENTILATION UPGRADES
CBJ Contract No. E16-095

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, Subcontractors, and corporations furnishing materials for, or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and all insurance premiums on said work, and for all labor performed in such WORK, whether by Subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the OWNER and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

BARTLETT REGIONAL HOSPITAL
OR VENTILATION UPGRADES
CBJ Contract No. E16-095

IN WITNESS WHEREOF, this instrument is issued in two (2) identical counterparts, each one of which shall be deemed an original.

CONTRACTOR:

By: _____
(Signature)

_____
(Printed Name)

_____
(Company Name)

_____
(Mailing Address)

_____
(City, State, Zip Code)

SURETY:

By: _____ Date Issued: _____
(Signature of Attorney-in-Fact)

_____
(Printed Name)

_____
(Company Name)

_____
(Mailing Address)

_____
(City, State, Zip Code)

(Affix SURETY'S SEAL)

NOTE: If CONTRACTOR is Partnership, <u>all</u> Partners must execute bond.

SECTION 00700 - GENERAL CONDITIONS

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SECTION 00700 - GENERAL CONDITIONS

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ARTICLE 1 DEFINITIONS

Wherever used in these General Conditions or in the Contract Documents the following terms have the meanings indicated which are applicable to both the singular and plural thereof. Where a word is capitalized in the definitions and is found not capitalized in the Contract Documents it has the ordinary dictionary definition.

Addenda - Written or graphic instruments issued prior to the opening of Bids which make additions, deletions, or revisions to the Contract Documents.

Agreement - The written contract between the OWNER and the CONTRACTOR covering the WORK to be performed; other documents are attached to the Agreement and made a part thereof as provided therein.

Application for Payment - The form furnished by the ARCHITECT which is to be used by the CONTRACTOR to request progress or final payment and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

ARCHITECT - The ARCHITECT is the firm or person(s) selected by the City and Borough of Juneau (CBJ) to perform the duties of project inspection and management. CBJ will inform the CONTRACTOR of the identity of the ARCHITECT at or before the Notice to Proceed.

Architect of Record – The individual, partnership, corporation, joint-venture or other legal entity legally responsible for preparation of Design and Construction Documents for the project.

Asbestos - Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

Bid - The offer or proposal of the Bidder submitted on the prescribed form setting forth the price or prices for the WORK.

Bonds - Bid, Performance, and Payment Bonds and other instruments which protect against loss due to inability or refusal of the CONTRACTOR to perform its contract.

CBJ - City and Borough of Juneau

CBJ Project Manager - The authorized representative of the City and Borough of Juneau Engineering Department, as OWNER, who is responsible for administration of the contract.

Change Order - A document recommended by the ARCHITECT, which is signed by the CONTRACTOR and the OWNER and authorizes an addition, deletion, or revision in the WORK, or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Agreement.

Contract Documents - The Table of Contents, Notice Inviting Bids, Instructions to Bidders, Bid Forms (including the Bid, Bid Schedule(s), Information Required of Bidder, Bid Bond, and all required certificates and affidavits), Agreement, Performance Bond, Payment Bond, General Conditions, Supplementary General Conditions, Technical Specifications, Drawings, Permits, and all Addenda, Field Orders and Change Orders executed pursuant to the provisions of the Contract Documents.

Contract Price - The total monies payable by the OWNER to the CONTRACTOR under the terms and conditions of the Contract Documents.

Contract Time - The number of successive calendar Days or the specific date stated in the Contract Documents for the completion of the WORK.

CONTRACTOR - The individual, partnership, corporation, joint-venture or other legal entity with whom the OWNER has executed the Agreement.

Day - A calendar day of 24 hours measured from midnight to the next midnight.

Defective WORK - WORK that is unsatisfactory, faulty, or deficient; or that does not conform to the Contract Documents; or that does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents; or WORK that has been damaged prior to the ARCHITECT's recommendation of final payment.

Drawings - The drawings, plans, maps, profiles, diagrams, and other graphic representations which indicate the character, location, nature, extent, and scope of the WORK and which have been prepared by the Architect of Record and are referred to in the Contract Documents. Shop Drawings are not within the meaning of this paragraph.

Effective Date of the Agreement - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

Field Order - A written order issued by the ARCHITECT which may or may not involve a change in the WORK.

General Requirements - Division 1 of the Technical Specifications.

Hazardous Waste - The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 9603) as amended from time to time.

Holidays - The CBJ legal holidays occur on:

A. New Year's Day - January 1
B. Martin Luther King's Birthday - Third Monday in January
C. President's Day - Third Monday in February
D. Seward's Day - Last Monday in March
E. Memorial Day - Last Monday in May
F. Independence Day - July 4
G. Labor Day - First Monday in September
H. Alaska Day - October 18
I. Veteran's Day - November 11
J. Thanksgiving Day - Fourth Thursday and the following Friday in November
K. Christmas Day - December 25.

If any holiday listed above falls on a Saturday, Saturday and the preceding Friday are both legal holidays. If the holiday should fall on a Sunday, Sunday and the following Monday are both legal holidays.

Inspector - The authorized representative of the ARCHITECT assigned to make detailed inspections for conformance to the Contract Documents. Any reference to the Resident Project Representative in this document shall mean the Inspector.

Laws and Regulations; Laws or Regulations - Any and all applicable laws, rules, regulations, ordinances, codes, and/or orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.

Mechanic's Lien - A form of security, an interest in real property, which is held to secure the payment of an obligation. When referred to in these Contract Documents, "Mechanic's Lien" or "lien" means "Stop Notice".

Milestone - A principal event specified in the Contract Documents relating to an intermediate completion date of a portion of the work, or a period of time within which the portion of the work should be performed prior to Substantial Completion of all the WORK.

Notice of Intent to Award - The written notice by the OWNER to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the requirements listed therein, within the time specified, the OWNER will enter into an Agreement.

Notice of Award - The written notice by the OWNER to the apparent successful bidder stating that the apparent successful bidder has complied with all conditions for award of the contract.

Notice of Completion - A form signed by the ARCHITECT and the CONTRACTOR recommending to the OWNER that the WORK is Substantially Complete and fixing the date of Substantial Completion. After acceptance of the WORK by the OWNER's governing body, the form is signed by the OWNER. This filing starts the 30 day lien filing period on the WORK.

Notice to Proceed - The written notice issued by the OWNER to the CONTRACTOR authorizing the CONTRACTOR to proceed with the WORK and establishing the date of commencement of the Contract Time.

OWNER - The City and Borough of Juneau (CBJ), acting through its legally designated officials, officers, or employees.

Partial Utilization - Use by the OWNER of a substantially completed part of the WORK for the purpose for which it is intended prior to Substantial Completion of all the WORK.

PCB's - Polychlorinated biphenyls.

Petroleum - Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Wastes and crude oils.

Project - The total construction of which the WORK to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

Radioactive Material - Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

Shop Drawings - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for the CONTRACTOR and submitted by the CONTRACTOR, to the ARCHITECT, to illustrate some portion of the WORK.

Specifications - Same definition as for "Technical Specifications" hereinafter.

Stop Notice - A legal remedy for subcontractors and suppliers who contribute to public works, but who are not paid for their work, which secures payment from construction funds possessed by the OWNER. For public property, the Stop Notice remedy is designed to substitute for mechanic's lien rights.

Sub-Consultant - The individual, partnership, corporation, joint-venture or other legal entity having a direct contract with Architect of Record, or with any of its Consultants to furnish services with respect to the Project.

Subcontractor - An individual, partnership, corporation, joint-venture or other legal entity having a direct contract with the CONTRACTOR, or with any of its Subcontractors, for the performance of a part of the WORK at the site.

Substantial Completion - Refers to when the WORK has progressed to the point where, in the opinion of the ARCHITECT as evidenced by Notice of Completion as applicable, it is sufficiently complete, in accordance with the Contract Documents, so that the WORK can be utilized for the purposes for which it is intended; or if no such notice is issued, when final payment is due in accordance with Paragraph 14.8. The terms "substantially complete" and "substantially completed" as applied to any WORK refer to Substantial Completion thereof.

Supplementary General Conditions - The part of the Contract Documents which make additions, deletions, or revisions to these General Conditions.

Supplier - A manufacturer, fabricator, supplier, distributor, material man, or vendor.

Technical Specifications - Divisions 1 through 16 of the Contract Documents consisting of the General Requirements and written technical descriptions of products and execution of the WORK.

Underground Utilities - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: water, sewage and drainage removal, electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, traffic, or other control systems.

WORK, Work - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. WORK is the result of performing, or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents.

ARTICLE 2 PRELIMINARY MATTERS

2.1 DELIVERY OF BONDS/INSURANCE CERTIFICATES. When the CONTRACTOR delivers the signed Agreements to the OWNER, the CONTRACTOR shall also deliver to the OWNER such Bonds and Insurance Policies and Certificates as the CONTRACTOR may be required to furnish in accordance with the Contract Documents.

2.2 COPIES OF DOCUMENTS. The OWNER shall furnish to the CONTRACTOR the required number of copies of the Contract Documents specified in the Supplementary General Conditions.

2.3 COMMENCEMENT OF CONTRACT TIME; NOTICE TO PROCEED. The Contract Time will start to run on the commencement date stated in the Notice to Proceed. If no date is stated, Contract Time shall commence upon the date of the Notice to Proceed is issued.

2.4 STARTING THE WORK

A. The CONTRACTOR shall begin to perform the WORK within 10 days after the commencement date stated in the Notice to Proceed, but no WORK shall be done at the site prior to said commencement date.

B. Before undertaking each part of the WORK, the CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. The CONTRACTOR shall promptly report in writing to the ARCHITECT any conflict, error, or discrepancy which the CONTRACTOR may discover and shall obtain a written interpretation or clarification from the ARCHITECT before proceeding with any WORK affected thereby.

C. The CONTRACTOR shall submit to the ARCHITECT for review those documents called for under Section 01300 - CONTRACTOR Submittals in the General Requirements.

2.5 PRE-CONSTRUCTION CONFERENCE. The CONTRACTOR is required to attend a Pre-Construction Conference. This conference will be attended by the ARCHITECT and others as appropriate in order to discuss the WORK in accordance with the applicable procedures specified in the General Requirements, Section 01010 - Summary of Work.

2.6 FINALIZING CONTRACTOR SUBMITTALS. At least 7 days before submittal of the first Application for Payment a conference attended by the CONTRACTOR, the ARCHITECT and others as appropriate will be held to finalize the initial CONTRACTOR submittals in accordance with the General Requirements. As a minimum the CONTRACTOR's representatives should include it's project manager and schedule expert. The CONTRACTOR should plan on this meeting taking no less than 8 hours. If the submittals are not finalized at the end of the meeting, additional meetings will be held so that the submittals can be finalized prior to the submittal of the first Application for Payment. No Application for Payment will be processed until CONTRACTOR submittals are finalized.

ARTICLE 3 CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.1 INTENT

A. The Contract Documents comprise the entire agreement between the OWNER and the CONTRACTOR concerning the WORK. The Contract Documents shall be construed as a whole in accordance with Alaska Law.

B. It is the intent of the Contract Documents to describe the WORK, functionally complete, to be constructed in accordance with the Contract Documents. Any WORK, materials, or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result shall be supplied whether or not specifically called for. When words or phrases which have a well-known technical or construction industry or trade meaning are used to describe WORK, materials, or equipment such words or phrases shall be interpreted in accordance with that meaning, unless a definition has been provided in Article 1 of the General Conditions. Reference to standard specifications, manuals, or codes of any technical society, organization, or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual, or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of the ARCHITECT, OWNER, the CONTRACTOR, or the Architect of Record or any of their consultants, agents, or employees from those set forth in the Contract Documents.

C. If, during the performance of the WORK, CONTRACTOR discovers any conflict, error, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such Law or Regulation applicable to the performance of the WORK or of any such standard, specification, manual or code or of any instruction of any Supplier referred to in paragraph 6.5, the CONTRACTOR shall report it to the ARCHITECT in writing at once, and the CONTRACTOR shall not proceed with the WORK affected thereby (except in an emergency as authorized by the ARCHITECT) until a clarification Field Order, or Change Order to the Contract Documents has been issued.

3.2 ORDER OF PRECEDENCE OF CONTRACT DOCUMENTS

A. In resolving conflicts resulting from, errors, or discrepancies in any of the Contract Documents, the order of precedence shall be as follows:

1. Permits from other agencies as may be required by law, excepting the definition of "Permittee" in these permits.
2. Field Orders
3. Change Orders
4. ARCHITECT’s written interpretations and clarifications.
5. Agreement
6. Addenda
7. CONTRACTOR's Bid (Bid Form)
8. Supplementary General Conditions
9. Notice Inviting Bids
10. Instructions to Bidders

11. General Conditions
12. Technical Specifications
13 Drawings

B. With reference to the Drawings the order of precedence is as follows:

1. Figures govern over scaled dimensions
2. Detail drawings govern over general drawings
3. Addenda/Change Order drawings govern over contract Drawings
4. Contract Drawings govern over standard details

3.3 AMENDING AND SUPPLEMENTING CONTRACT DOCUMENTS. The Contract Documents may be amended to provide for additions, deletions, and revisions in the WORK or to modify the terms and conditions thereof by a Change Order (pursuant to Article 10 CHANGES IN THE WORK).

3.4 REUSE OF DOCUMENTS. Neither the CONTRACTOR, nor any Subcontractor or Supplier, nor any other person or organization performing any of the WORK under a contract with the OWNER shall have or acquire any title to or ownership rights in any of the Drawings, Technical Specifications, or other documents used on the WORK, and they shall not reuse any of them on the extensions of the Project or any other project without written consent of the OWNER.

ARTICLE 4 AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS

4.1 AVAILABILITY OF LANDS. The OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the WORK is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of the CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by the OWNER, unless otherwise provided in the Contract Documents. Nothing contained in the Contract Documents shall be interpreted as giving the CONTRACTOR exclusive occupancy of the lands or rights-of-way provided. The CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment; provided, that the CONTRACTOR shall not enter upon nor use any property not under the control of the OWNER until a written temporary construction easement, lease or other appropriate agreement has been executed by the CONTRACTOR and the property owner, and a copy of said agreement furnished to the ARCHITECT prior to said use; and, neither the OWNER nor the ARCHITECT shall be liable for any claims or damages resulting from the CONTRACTOR's unauthorized trespass or use of any such properties.

4.2 PHYSICAL CONDITIONS - SUBSURFACE AND EXISTING STRUCTURES

A. Explorations and Reports. Reference is made to SGC 4.2 Physical Conditions of the Supplementary General Conditions for identification of those reports of explorations and tests of sub-surface conditions at the site that have been utilized by the Architect of Record in the preparation of the Contract Documents. The CONTRACTOR may rely upon the accuracy of the technical data contained in such reports, however, reports are not to be considered complete or comprehensive and nontechnical data, interpretations, and opinions contained in such reports are not to be relied on by the CONTRACTOR. The CONTRACTOR is responsible for any further explorations or tests that may be

necessary and any interpretation, interpolation, or extrapolation that it makes of any information shown in such reports.

B. Existing Structures. Reference is made to SGC 4.2 Physical Conditions of the Supplementary General Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Utilities referred to in Paragraph 4.4 herein) which are at or contiguous to the site that have been utilized by the Architect of Record in the preparation of the Contract Documents. The CONTRACTOR may rely upon the accuracy of the technical data contained in such drawings, however, nontechnical data, interpretations, and opinions contained in such drawings are not to be relied on by the CONTRACTOR. The CONTRACTOR is also responsible for any interpretation, interpolation, or extrapolation that it makes of any information shown in such drawings.

4.3 DIFFERING SITE CONDITIONS

A. The CONTRACTOR shall promptly upon discovery (but in no event later than 14 days thereafter) and before the following conditions are disturbed, notify the ARCHITECT, in writing of any:

1. Material that the CONTRACTOR believes may be material that is hazardous waste, as defined in Article 1 of these General Conditions, or asbestos, PCB’s, petroleum or any other substance or material posing a threat to human or to the environment.
2. Subsurface or latent physical conditions at the site differing from those indicated.
3. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the contract.

B. The ARCHITECT shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the CONTRACTOR's cost of, or the time required for, performance of any part of the WORK shall issue a Change Order under the procedures described in the contract.

C. In the event that a dispute arises between the ARCHITECT and the CONTRACTOR whether the conditions materially differ, or involved hazardous waste or other materials listed above, or cause a decrease or increase in the CONTRACTOR's cost of, or time required for, performance of any part of the WORK, the CONTRACTOR shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with all WORK to be performed under the contract. The CONTRACTOR shall retain any and all rights provided either by contract or by Law which pertain to the resolution of disputes and protests between the contracting parties.

4.4 PHYSICAL CONDITIONS - UNDERGROUND UTILITIES

A. Indicated. The information and data indicated in the Contract Documents with respect to existing Underground Utilities at or contiguous to the site are based on information and data furnished to the OWNER or the Architect of Record by the owners of such Underground Utilities or by others. Unless it is expressly provided in the Supplementary General Conditions and/or Section 01530 - Protection and Restoration of Existing Facilities, the OWNER and the Architect of Record shall not be responsible for the accuracy or completeness of any such information or data, and the CONTRACTOR shall have full responsibility for reviewing and checking all such information and data, for locating all Underground Utilities indicated in the Contract Documents, for coordination of

the WORK with the owners of such Underground Utilities during construction, for the safety and protection thereof and repairing any damage thereto resulting from the WORK, the cost of which will be considered as having been included in the Contract Price.

B. Not Indicated. If an Underground Utility is uncovered or revealed at or contiguous to the site which was not indicated in the Contract Documents and which the CONTRACTOR could not reasonably have been expected to be aware of, the CONTRACTOR shall identify the owner of such Underground Utility and give written notice thereof to that owner and shall notify the ARCHITECT in accordance with the requirements of the Supplementary General Conditions and Section 01530 - Protection and Restoration of Existing Facilities of the General Requirements.

4.5 REFERENCE POINTS

A. The ARCHITECT will provide one bench mark, near or on the site of the WORK, and will provide two points near or on the site to establish a base line for use by the CONTRACTOR for alignment control. Unless otherwise specified in the General Requirements, the CONTRACTOR shall furnish all other lines, grades, and bench marks required for proper execution of the WORK.

B. The CONTRACTOR shall preserve all bench marks, stakes, and other survey marks, and in case of their removal or destruction by its own employees or by its subcontractor's employees, the CONTRACTOR shall be responsible for the accurate replacement of such reference points by personnel qualified under the Alaska Statute governing the licensing of architects, engineers, and land surveyors.

4.6 USE OF THE CBJ/STATE LEMON CREEK GRAVEL PIT

A. On City and Borough of Juneau (CBJ) construction projects, the CBJ may make unclassified material available to CONTRACTORs, from the CBJ/State Lemon Creek gravel pit, at a rate less than charged other customers. CONTRACTORs are not required to use material from the CBJ/State pit and the CBJ makes no guarantee as to the quantity or quality of the available material. For this Project, the price shall be $1.90 per ton.

B. CONTRACTORs proposing to use gravel from the CBJ/State pit are required to be in good standing for all amounts owed to the CBJ, for previous gravel operations, prior to submitting a mining plan for approval. CONTRACTORs using the pit must comply with Allowable Use Permit USE 98-00047. Failure to meet these requirements, if so subject, shall be sufficient reason to deny use of the CBJ/State pit as a gravel source. To determine if your company is subject to these requirements, contact the CBJ Engineering Department, Gravel Pit Management, at (907) 586-0883.

C. CONTRACTORs deciding to use material from the CBJ/State pit shall provide an Individual Mining Plan prepared by a professional engineer registered in the State of Alaska. The Individual Mining Plan must be reviewed and approved by the CBJ, prior to commencing operations within the pit. CONTRACTORs shall also secure a Performance Bond to ensure compliance with contract provisions, including any Individual Mining Plan stipulations. The bond shall remain in full force and effect until a release is obtained from the CBJ.

D. If CONTRACTOR operations for a Project do not exceed 500 tons of material, the CONTRACTOR will not be required to provide an Individual Mining Plan prepared by an engineer, however, the CONTRACTOR must submit an Individual Mining Plan that is in compliance with Allowable Use

Permit USE 98-00047 for gravel extraction within the CBJ/State pit. The CONTRACTOR must contact the CBJ Engineering Department for conditions for the extraction.

E. CONTRACTORs using the CBJ material may do primary dry separation (screening) of materials within the pit. Crushing and washing of material will not be allowed. CONTRACTORs shall account for placement of materials removed from the pit. The CBJ may require CONTRACTORs to cross-check weight tickets, submit to an audit, or participate in other measures required by the CBJ to ensure accountability. Unprocessed overburden removed from the pit will not be weighed. All other material mined will be weighed at the CBJ scale. CONTRACTORs will be responsible for loading and/or screening their own material. If asphalt pavement is removed as part of the WORK, CONTRACTORs shall dispose of the material at a to-be-specified location within the pit area, as directed by the CBJ Gravel Pit Manager, (907) 586-0883.

F. The gravel pit overhead charge shall be paid to the CBJ by the CONTRACTOR within 60 days after removal of all materials from the pit and prior to requesting and/or receiving final payment. Upon completion of each excavation CONTRACTORs shall notify the CBJ, in writing, in sufficient time to perform a field-compliance examination prior to vacating the pit. Any significant deviation from the stipulations of the Individual Mining Plan identified during the field inspection shall be corrected by the CONTRACTOR prior to release of the bond. A signed release from CBJ will be required prior to releasing the CONTRACTOR's bond.

G. If asphalt pavement is removed as part of this WORK, the CONTRACTOR shall dispose of the material at the location designated as the Asphalt Storage Facility, or as directed by the ARCHITECT.

H. The CBJ/State Pit is a seasonal operation. The hours of operation are from 7:00 a.m. to 6:00 p.m., Monday through Friday, from April 1 through October 15 of the year. CONTRACTORs may obtain gravel on weekends, or during the off-season, by applying for a separate agreement with the City and Borough of Juneau Engineering Department. The CONTRACTOR will be responsible for any additional costs incurred during weekend or off-season operations at the gravel pit.

I. All CONTRACTORs/equipment operators using the CBJ/State Pit shall be in compliance with Federal Mine Safety and Health Administration regulations for quarry and gravel operations.

ARTICLE 5 BONDS AND INSURANCE

5.1 PERFORMANCE, PAYMENT, AND OTHER BONDS

A. The CONTRACTOR shall furnish Performance and Payment Bonds, each in the amount set forth in the Supplementary General Conditions as security for the faithful performance and payment of all the CONTRACTOR's obligations under the Contract Documents. These bonds shall remain in effect at least until one year after the date of Substantial Completion except as otherwise provided by Law or Regulation or by the Contract Documents. The CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary General Conditions. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

B. If the surety on any Bond furnished by the CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the WORK is located, the CONTRACTOR shall within 7 days thereafter substitute another Bond and Surety, which must be acceptable to the OWNER.

C. All Bonds required by the Contract Documents to be purchased and maintained by CONTRACTOR shall be obtained from surety companies that are duly licensed or authorized in the State of Alaska to issue Bonds for the limits so required. Such surety companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary General Conditions.

5.2 INSURANCE

A. The CONTRACTOR shall purchase and maintain the insurance required under this paragraph. Such insurance shall include the specific coverages set out herein and be written for not less than the limits of liability and coverages provided in the Supplementary General Conditions, or required by law, whichever are greater. All insurance shall be maintained continuously during the life of the Agreement up to the date of Final Completion and at all times thereafter when the CONTRACTOR may be correcting, removing, or replacing Defective WORK in accordance with Paragraph 13.6, but the CONTRACTOR's liabilities under this Agreement shall not be deemed limited in any way to the insurance coverage required.

B. All insurance required by the Contract Documents to be purchased and maintained by the CONTRACTOR shall be obtained from insurance companies that are duly licensed or authorized in the State of Alaska to issue insurance policies for the limits and coverages so required. Such insurance companies shall have a current Best's Rating of at least an "A" (Excellent) general policy holder's rating and a Class VII financial size category and shall also meet such additional requirements and qualifications as may be provided in the Supplementary General Conditions.

C. The CONTRACTOR shall furnish the OWNER with certificates showing the type, amount, class of operations covered, effective dates and dates of expiration of policies. All of the policies of insurance so required to be purchased and maintained (or the certificates or other evidence thereof) shall contain a provision or endorsement that the coverage afforded will not be cancelled, reduced in coverage, or renewal refused until at least 30 days' prior written notice has been given to the OWNER by certified mail. All such insurance required herein (except for Workers' Compensation and Employer's Liability) shall name the OWNER, its Consultants and subconsultants and their officers, directors, agents, and employees as "additional insureds" under the policies. The CONTRACTOR shall purchase and maintain the following insurance:

1. Workers' Compensation and Employer's Liability. This insurance shall protect the CONTRACTOR against all claims under applicable state workers' compensation laws. The CONTRACTOR shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a Workers' Compensation law. This policy shall include an "all states" endorsement. The CONTRACTOR shall require each Subcontractor similarly to provide Workers' Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the CONTRACTOR's Workers' Compensation Insurance. In case any class of employees is not protected, under the Workers' Compensation Statute, the

CONTRACTOR shall provide and shall cause each subcontractor to provide adequate employer's liability insurance for the protection of such of its employees as are not otherwise protected.

2. Commercial General Liability. This insurance shall be written in comprehensive form and shall protect the CONTRACTOR against all claims arising from injuries to persons other than its employees or damage to property of the OWNER or others arising out of any act or omission of the CONTRACTOR or its agents, employees, or Subcontractors. The policy shall contain no exclusions for any operations within the scope of this contract.
3. Comprehensive Automobile Liability. This insurance shall be written in comprehensive form and shall protect the CONTRACTOR against all claims for injuries to members of the public and damage to property of others arising from the use of motor vehicles, and shall cover operation on or off the site of all motor vehicles licensed for highway use, whether they are owned, non-owned, or hired. Coverage for hired motor vehicles should include endorsement covering liability assumed under this contract.
4. Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance. The CONTRACTOR shall either require each of its Subcontractors to procure and to maintain Subcontractor’s Commercial General Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified in the Supplementary General Conditions or insure the activities of its subcontractors in the CONTRACTOR’s own policy, in like amount.
5. Builder’s Risk. This insurance shall be of the “all risks” type, shall be written in completed value form, and shall protect the CONTRACTOR, the OWNER, and the ARCHITECT, against risks of damage to buildings, structures, and materials and equipment. The amount of such insurance shall be not less than the insurable value of the WORK at completion. Builder's risk insurance shall provide for losses to be payable to the CONTRACTOR and the OWNER, as their interests may appear. The policy shall contain a provision that in the event of payment for any loss under the coverage provided, the insurance company shall have no rights of recovery against the CONTRACTOR, the OWNER, and the ARCHITECT. The Builder’s Risk policy shall insure against all risks of direct physical loss or damage to property from any external cause including flood and earthquake. Allowable exclusions, if any, shall be as specified in the Supplementary General Conditions.

ARTICLE 6 CONTRACTOR'S RESPONSIBILITIES

6.1 SUPERVISION AND SUPERINTENDENCE

A. The CONTRACTOR shall supervise, inspect, and direct the WORK competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the WORK in accordance with the Contract Documents. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incidental thereto. The CONTRACTOR shall be responsible to see that the completed WORK complies accurately with the Contract Documents.

B. The CONTRACTOR shall designate in writing and keep on the work site at all times during its progress a technically qualified, English-speaking superintendent, who is an employee of the CONTRACTOR and who shall not be replaced without written notice to the OWNER and the ARCHITECT. The superintendent will be the CONTRACTOR's representative at the site and shall

have authority to act on behalf of the CONTRACTOR. All communications given to the superintendent shall be as binding as if given to the CONTRACTOR. The CONTRACTOR shall issue all its communications to the OWNER through the ARCHITECT and the ARCHITECT only.

C. The CONTRACTOR's superintendent shall be present at the site of the WORK at all times while WORK is in progress. Failure to observe this requirement shall be considered suspension of the WORK by the CONTRACTOR until such time as such superintendent is again present at the site.

6.2 LABOR, MATERIALS, AND EQUIPMENT

A. The CONTRACTOR shall provide competent, suitably qualified personnel to survey and lay out the WORK and perform construction as required by the Contract Documents. The CONTRACTOR shall furnish, erect, maintain, and remove the construction plant and any temporary works as may be required. The CONTRACTOR shall at all times maintain good discipline and order at the site. Except in connection with the safety or protection of persons or the WORK or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all WORK at the site shall be performed during regular working hours, and the CONTRACTOR will not permit overtime WORK or the performance of WORK on Saturday, Sunday, or any legal holiday without the OWNER's written consent. The CONTRACTOR shall apply for this consent through the ARCHITECT.

B. Except as otherwise provided in this Paragraph, the CONTRACTOR shall receive no additional compensation for overtime WORK, i.e., work in excess of 8 hours in any one calendar day or 40 hours in any one calendar week, even though such overtime WORK may be required under emergency conditions and may be ordered by the ARCHITECT in writing. Additional compensation will be paid the CONTRACTOR for overtime WORK only in the event extra WORK is ordered by the ARCHITECT and the Change Order specifically authorizes the use of overtime WORK and then only to such extent as overtime wages are regularly being paid by the CONTRACTOR for overtime WORK of a similar nature in the same locality.

C. All costs of inspection and testing performed during overtime WORK by the CONTRACTOR which is allowed solely for the convenience of the CONTRACTOR shall be borne by the CONTRACTOR. The ARCHITECT shall have the authority to deduct the cost of all such inspection and testing from any partial payments otherwise due to the CONTRACTOR.

D. Unless otherwise specified in the Contract Documents, the CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up, and completion of the WORK.

E. All materials and equipment to be incorporated into the WORK shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of the OWNER. If required by the ARCHITECT, the CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provisions of any such instructions will be effective to assign to the ARCHITECT, or any of the Architect's of Record consultants, agents, or employees, any duty or authority to supervise or direct the

furnishing or performance of the WORK or any duty or authority to undertake responsibility contrary to the provisions of Paragraphs 9.9C and 9.9D.

F. The CONTRACTOR shall at all times employ sufficient labor and equipment for prosecuting the several classes of WORK to full completion in the manner and time set forth in and required by these specifications. All workers shall have sufficient skill and experience to properly perform the WORK assigned to them. Workers engaged in special WORK, or skilled WORK, shall have sufficient experience in such WORK and in the operation of the equipment required to perform all WORK, properly and satisfactorily.

G. Any person employed by the CONTRACTOR or by any SUBCONTRACTOR who, in the opinion of the ARCHITECT, does not perform the WORK in a proper and skillful manner, or is intemperate or disorderly shall, at the written request of the ARCHITECT, be removed forthwith by the CONTRACTOR or Subcontractor employing such person, and shall not be employed again in any portion of the WORK without the approval of the ARCHITECT. Should the CONTRACTOR fail to remove such person or persons as required above, or fail to furnish suitable and sufficient personnel for the proper prosecution of the WORK, the ARCHITECT may suspend the WORK by written notice until such orders are complied with.

6.3 ADJUSTING PROGRESS SCHEDULE. The CONTRACTOR shall submit monthly updates of the progress schedule to the ARCHITECT for acceptance in accordance with the provisions in Section 01300 - CONTRACTOR Submittals in the General Requirements.

6.4 SUBSTITUTES OR "OR-EQUAL" ITEMS. The CONTRACTOR shall submit proposed substitutes or "or-equal" items in accordance with the provisions in Section 01300 - CONTRACTOR Submittals in the General Requirements.

6.5 CONCERNING SUBCONTRACTORS, SUPPLIERS, AND OTHERS. The CONTRACTOR shall be responsible to the OWNER and the ARCHITECT of Record for the acts and omissions of its subcontractors and their employees to the same extent as CONTRACTOR is responsible for the acts and omissions of its own employees. Nothing contained in this Paragraph shall create any contractual relationship between any subcontractor and the OWNER or the ARCHTIECT nor relieve the CONTRACTOR of any liability or obligation under the contract.

6.6 PERMITS

A. Unless otherwise provided in the Supplementary General Conditions, the CONTRACTOR shall obtain and pay for all construction permits and licenses from the agencies having jurisdiction, including the furnishing of insurance and Bonds if required by such agencies. The enforcement of such requirements under this contract shall not be made the basis for claims for additional compensation. The OWNER shall assist the CONTRACTOR, when necessary, in obtaining such permits and licenses. The CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the WORK, which are applicable at the time of opening of Bids. The CONTRACTOR shall pay all charges of utility owners for connections to the WORK.

B. These Contract Documents may require that the WORK be performed within the conditions and/or requirements of local, state and/or federal permits. These permits may be bound within the Contract Documents, included within the Contract Documents by reference, or included as part of the WORK, as designated in this Section. The CONTRACTOR is responsible for completing the WORK required

for compliance with all permit requirements; this WORK is incidental to other items in the Contract Documents. Any reference to the PERMITTEE in the permits shall mean the CONTRACTOR. If any permits were acquired by the OWNER, this action was done to expedite the start of construction. If the CONTRACTOR does not complete the WORK within the specified permit window, the CONTRACTOR shall be responsible for the permit extension, and for completing any additional requirements placed upon the permit.

6.7 PATENT FEES AND ROYALTIES. The CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the WORK or the incorporation in the WORK of any invention, design, process, product, software or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the WORK and if to the actual knowledge of the OWNER or the Architect of Record its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by the OWNER in the Contract Documents. The CONTRACTOR shall indemnify, defend and hold harmless the OWNER and the Architect of Record and anyone directly or indirectly employed by either of them from and against all claims, damages, losses, and expenses (including attorneys' fees and court costs) arising out of any infringement of patent rights or copyrights incident to the use in the performance of the WORK or resulting from the incorporation in the WORK of any invention, design, process, product, or device not specified in the Contract Documents, and shall defend all such claims in connection with any alleged infringement of such rights.

6.8 LAWS AND REGULATIONS. The CONTRACTOR shall observe and comply with all federal, state, and local laws, ordinances, codes, orders, and regulations which in any manner affect those engaged or employed on the WORK, the materials used in the WORK, or the conduct of the WORK. If any discrepancy or inconsistency should be discovered in this contract in relation to any such law, ordinance, code, order, or regulation, the CONTRACTOR shall report the same in writing to the ARCHITECT. The CONTRACTOR shall indemnify, defend, and hold harmless the OWNER, the Architect of Record, and their officers, agents, and employees against all claims or liability arising from violation of any such law, ordinance, code, order, or regulation, whether by CONTRACTOR or by its employees, Subcontractors, or third parties. Any particular law or regulation specified or referred to elsewhere in the Contract Documents shall not in any way limit the obligation of the CONTRACTOR to comply with all other provisions of federal, state, and local laws and regulations.

6.9 TAXES. The CONTRACTOR shall pay all sales, consumer, use, and other similar taxes required to be paid by the CONTRACTOR in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the WORK.

6.10 USE OF PREMISES. The CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers to (1) the Project site, (2) the land and areas identified in and permitted by the Contract Documents, and (3) the other land and areas permitted by Laws and Regulations, rights-of-way, permits, leases and easements. The CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the WORK. Should any claim be made against the OWNER or the Architect of Record by any such owner or occupant because of the performance of the WORK, the CONTRACTOR shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim through litigation. The CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify, defend, and hold the OWNER and the Architect of Record harmless from and against all claims, damages, losses, and

expenses (including, but not limited to, fees of Architect's of Records attorneys, and other professionals and court costs) arising directly, indirectly, or consequentially out of any action, legal or equitable, brought by any such owner or occupant against the OWNER, the Architect of Record, their consultants, sub-consultants, and the officers, directors, employees and agents of each and any of them to the extent caused by or based upon the CONTRACTOR's performance of the WORK.

6.11 SAFETY AND PROTECTION

A. The CONTRACTOR shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the WORK. The CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all employees on the WORK and other persons and organizations who may be affected thereby;
2. all the WORK and materials and equipment to be incorporated therein, whether in storage on or off the site; and
3. other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

B. The CONTRACTOR shall comply with all applicable Laws and Regulations whether referred to herein or not) of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss and shall erect and maintain all necessary safeguards for such safety and protection. The CONTRACTOR shall notify owners of adjacent property and utilities when prosecution of the WORK may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. The CONTRACTOR shall designate a qualified and experienced safety representative at the site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and program.

D. Materials that contain hazardous substances or mixtures may be required on the WORK. A Material Safety Data Sheet (MSDS) shall be requested by the CONTRACTOR from the manufacturer of any hazardous product used.

E. Material usage shall be accomplished with strict adherence to all safety requirements and all manufacturer's warnings and application instructions listed on the Material Safety Data Sheet and on the product container label.

F. The CONTRACTOR shall be responsible for coordinating communications on any exchange of Material Safety Data Sheets or other hazardous material information that is required to be made available to, or exchanged between, or among, employers at the site in accordance with Laws or Regulations.

G. The CONTRACTOR shall notify the ARCHITECT if it considers a specified product or its intended usage to be unsafe. This notification must be given to the ARCHITECT prior to the product being ordered, or if provided by some other party, prior to the product being incorporated in the WORK.

6.12 SHOP DRAWINGS AND SAMPLES

A. After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, the CONTRACTOR shall submit to the ARCHITECT for review, all Shop Drawings in accordance with Section 01300 - CONTRACTOR Submittals in the General Requirements.

B. The CONTRACTOR shall also submit to the ARCHITECT for review all samples in accordance with Section 01300 - CONTRACTOR Submittals in the General Requirements.

C. Before submittal of each Shop Drawing or sample, the CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the WORK and the Contract Documents.

6.13 CONTINUING THE WORK. The CONTRACTOR shall carry on the WORK and adhere to the progress schedule during all disputes or disagreements with the OWNER. No WORK shall be delayed or postponed pending resolution of any disputes or disagreements, except as the CONTRACTOR and the OWNER may otherwise agree in writing.

6.14 INDEMNIFICATION

A. To the fullest extent permitted by Laws and Regulations, the CONTRACTOR shall indemnify, defend, and hold harmless the OWNER, the Architect of Record, their consultants, sub-consultants and the officers, directors, employees, and agents of each and any of them, against and from all claims and liability arising under, by reason of or incidentally to the contract or any performance of the WORK, but not from the sole negligence or willful misconduct of the OWNER, and the Architect of Record. Such indemnification by the CONTRACTOR shall include but not be limited to the following:

1. Liability or claims resulting directly or indirectly from the negligence or carelessness of the CONTRACTOR, its employees, or agents in the performance of the WORK, or in guarding or maintaining the same, or from any improper materials, implements, or appliances used in its construction, or by or on account of any act or omission of the CONTRACTOR, its employees, agents, or third parties;
2. Liability or claims arising directly or indirectly from bodily injury, occupational sickness or disease, or death of the CONTRACTOR’s or Subcontractor’s own employees engaged in the WORK resulting in actions brought by or on behalf of such employees against the OWNER, or the Architect of Record;
3. Liability or claims arising directly or indirectly from or based on the violation of any law, ordinance, regulation, order, or decree, whether by the CONTRACTOR, its employees, or agents;
4. Liability or claims arising directly or indirectly from the use or manufacture by the CONTRACTOR, its employees, or agents in the performance of this contract of any copyrighted or non-copyrighted composition, secret process, patented or non-patented invention, computer software, article, or appliance, unless otherwise specifically stipulated in this contract.

5. Liability or claims arising directly or indirectly from the breach of any warranties, whether express or implied, made to the ARCHITECT, OWNER or any other parties by the CONTRACTOR, its employees, or agents;
6. Liabilities or claims arising directly or indirectly from the willful or criminal misconduct of the CONTRACTOR, its employees, or agents; and,
7. Liabilities or claims arising directly or indirectly from any breach of the obligations assumed herein by the CONTRACTOR.

B. The CONTRACTOR shall reimburse the OWNER and the Architect of Record for all costs and expenses, (including but not limited to fees and charges of Architects of Record, attorneys, and other professionals and court costs including all costs of appeals) incurred by the OWNER, and the Architect of Record in enforcing the provisions of this Paragraph 6.14.

C. The indemnification obligation under this Paragraph 6.14 shall not be limited in any way by any limitation of the amount or type of damages, compensation, or benefits payable by or for the CONTRACTOR or any such Subcontractor or other person or organization under workers' compensation acts, disability benefit acts, or other employee benefit acts.

6.15 CONTRACTOR'S DAILY REPORTS. The CONTRACTOR shall complete a daily report indicating total manpower for each construction trade, major equipment on site, each Subcontractor's manpower, weather conditions, etc., involved in the performance of the WORK. The daily report shall be completed on forms provided by the ARCHITECT and shall be submitted to the ARCHITECT at the conclusion of each WORK day. The report should comment on the daily progress and status of the WORK within each major component of the WORK. These components will be decided by the ARCHITECT. The CONTRACTOR shall record the name, affiliation, time of arrival and departure, and reason for visit for all visitors to the location of the WORK.

6.16 ASSIGNMENT OF CONTRACT. The CONTRACTOR shall not assign, sublet, sell, transfer, or otherwise dispose of the contract or any portion thereof, or its right, title, or interest therein, or obligations thereunder, without the written consent of the OWNER except as imposed by law. If the CONTRACTOR violates this provision, the contract may be terminated at the option of the OWNER. In such event, the OWNER shall be relieved of all liability and obligations to the CONTRACTOR and to its assignee or transferee, growing out of such termination.

6.17 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTY AND SERVICES. It is understood that any turn-on, or turn-off line locates and any other WORK or assistance necessary by the CBJ Water Utilities Division, will be at the CONTRACTOR's expense unless otherwise stated in the bid documents. All cost must be agreed to prior to any related actions, and will be considered incidental to the Project cost. Billing to the CONTRACTOR will be direct from the CBJ Water Utilities Division.

6.18 OPERATING WATER SYSTEM VALVES

A. The CONTRACTOR shall submit a written request, to the ARCHITECT, for approval to operate any valve on any in-service section of the CBJ water system. The request must be submitted at least 24-hours prior to operating any valves. The CBJ Water Utilities Division reserves the right to approve or deny the request. The request shall specifically identify each valve to be operated, the time of operation, and the operation to be performed. The CONTRACTOR shall obtain the written approval of the ARCHITECT for any scheduled operation before operating any valve.

B. The CONTRACTOR shall be responsible for all damages, both direct and consequential, to the OWNER or any other party, caused by unauthorized operation of any valve of the CBJ water system.

6.19 CONTRACTOR'S WORK SCHEDULE LIMITATIONS. Construction of Buildings and Projects. It is unlawful to operate any pile driver, power shovel, pneumatic hammer, derrick, power hoist, or similar heavy construction equipment before 7:00 a.m. or after 10:00 p.m., Monday through Friday, or before 9:00 a.m. or after 10:00 p.m., Saturday and Sunday, unless a permit shall first be obtained from the City and Borough Building Official. Such permit shall be issued by the Building Official only upon a determination that such operation during hours not otherwise permitted hereunder is necessary and will not result in unreasonable disturbance to surrounding residents.

ARTICLE 7 OTHER WORK

7.1 RELATED WORK AT SITE

A. The OWNER may perform other work related to the Project at the site by the OWNER's own forces, have other work performed by utility owners, or let other direct contracts therefor which may contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to the CONTRACTOR prior to starting any such other work.

B. The CONTRACTOR shall afford each other contractor who is a party to such a direct contract and each utility owner (or the OWNER, if the OWNER is performing the additional work with the OWNER's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate with their WORK. The CONTRACTOR shall do all cutting, fitting, and patching of the WORK that may be required to make its several parts come together properly and integrate with such other work. The CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of the ARCHITECT and the others whose work will be affected.

C. If the proper execution or results of any part of the CONTRACTOR's WORK depends upon the work of any such other contractor or utility owner (or OWNER), the CONTRACTOR shall inspect and report to the ARCHITECT in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for such proper execution and results. The CONTRACTOR's failure to report such delays, defects, or deficiencies will constitute an acceptance of the other work as fit and proper for integration with the CONTRACTOR's WORK except for latent or nonapparent defects and deficiencies in the other work.

7.2 COORDINATION. If the OWNER contracts with others for the performance of other work on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the Supplementary General Conditions, and the specific matters to be covered by such authority and responsibility will be itemized and the extent of such authority and responsibilities will be provided in the Supplementary General Conditions.

ARTICLE 8 OWNER'S RESPONSIBILITIES

8.1 COMMUNICATIONS

A. The OWNER shall issue all its communications to the CONTRACTOR through the ARCHITECT.

B. The CONTRACTOR shall issue all its communications to the OWNER through the ARCHITECT.

8.2 PAYMENTS. The OWNER shall make payments to the CONTRACTOR as provided in Paragraphs 14.5, 14.8, 14.9 and 14.10.

8.3 LANDS, EASEMENTS, AND SURVEYS. The OWNER's duties in respect of providing lands and easements and providing surveys to establish reference points are set forth in Paragraphs 4.1 and 4.5.

8.4 CHANGE ORDERS. The OWNER shall execute Change Orders as indicated in Paragraph 10.1F.

8.5 INSPECTIONS AND TESTS. The OWNER's responsibility in respect of inspections, tests, and approvals is set forth in Paragraph 13.3.

8.6 SUSPENSION OF WORK. In connection with the OWNER's right to stop WORK or suspend WORK, see Paragraphs 13.4 and 15.1.

8.7 TERMINATION OF AGREEMENT. Paragraphs 15.2 and 15.3 deal with the OWNER's right to terminate services of the CONTRACTOR.

ARTICLE 9 ARCHITECT'S STATUS DURING CONSTRUCTION

9.1 OWNER'S REPRESENTATIVE. The ARCHITECT will be the OWNER's representative during the construction period. The duties and responsibilities and the limitations of authority of the ARCHITECT as the OWNER's representative during construction are set forth in the Contract Documents.

9.2 VISITS TO SITE. The ARCHITECT will make visits to the site during construction to observe the progress and quality of the WORK and to determine, in general, if the WORK is proceeding in accordance with the Contract Documents. Exhaustive or continuous on-site inspections to check the quality or quantity of the WORK will not be required of the ARCHITECT. The ARCHITECT will not, during such visits, or as a result of such observations of the CONTRACTOR's WORK in progress, supervise, direct, or have control over the CONTRACTOR's WORK.

9.3 PROJECT REPRESENTATION. The ARCHITECT may furnish an Inspector to assist in observing the performance of the WORK. The duties, responsibilities, and limitations of authority of any such Inspector and assistants will be as provided in the Supplementary General Conditions.

9.4 CLARIFICATIONS AND INTERPRETATIONS. The ARCHITECT will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as the ARCHITECT may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents.

9.5 AUTHORIZED VARIATIONS IN WORK. The ARCHITECT may authorize variations in the WORK from the requirements of the Contract Documents. These may be accomplished by a Field Order and will require the CONTRACTOR to perform the WORK involved in a manner that minimizes the impact to the WORK and the contract completion date. If the CONTRACTOR believes that a Field Order justifies an increase in the Contract Price or an extension of the Contract Time, the CONTRACTOR may make a claim therefor as provided in Article 11 or 12.

9.6 REJECTING OR ACCEPTING DEFECTIVE WORK. The ARCHITECT will have authority to reject or accept WORK which the ARCHITECT believes to be defective and will also have authority to require special inspection or testing of the WORK as provided in Paragraph 13.3G, whether or not the WORK is fabricated, installed, or completed.

9.7 CONTRACTOR SUBMITTALS, CHANGE ORDERS, AND PAYMENTS

A. In accordance with the procedures set forth in the General Requirements, the ARCHITECT will review all CONTRACTOR submittals, including Shop Drawings, samples, substitutes, or "or equal" items, etc., in order to determine if the items covered by the submittals will, after installation or incorporation in the WORK, conform to the requirements of the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. The ARCHITECT's review will not extend to means, methods, techniques, sequences or procedures of construction or to safety precautions or programs incident thereto.

B. In connection with the ARCHITECT's responsibilities as to Change Orders, see Articles 10, 11, and 12.

C. In connection with the ARCHITECT's responsibilities in respect of Applications for Payment, see Article 14.

9.8 DECISIONS ON DISPUTES

A. The ARCHITECT will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the WORK thereunder. Claims, disputes, and other matters relating to the acceptability of the WORK; the interpretation of the requirements of the Contract Documents pertaining to the performance of the WORK; and those claims under Articles 11 and 12 in respect to changes in the Contract Price or Contract Time will be referred initially to the ARCHITECT in writing with a request for formal decision in accordance with this paragraph, which the ARCHITECT will render in writing within 30 days of receipt of the request. Written notice of each such claim, dispute, and other matter will be delivered by the CONTRACTOR to the ARCHITECT promptly (but in no event later than 30 days) after the occurrence of the event giving rise thereto. Written supporting data will be submitted to the ARCHITECT within 60 days after such occurrence unless the ARCHITECT allows an additional period of time to ascertain more accurate data in support of the claim.

B. The rendering of a decision by the ARCHITECT with respect to any such claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in Paragraph 14.12) will be a condition precedent to any exercise by the OWNER or the CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Law or Regulations in respect of any such claim, dispute, or other matter.

9.9 LIMITATION ON ARCHITECT'S RESPONSIBILITIES

A. Neither the ARCHITECT's authority to act under this Article or other provisions of the Contract Documents nor any decision made by the ARCHITECT in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of the ARCHITECT to the CONTRACTOR, any Subcontractor, any Supplier, any surety for any of them, or any other person or organization performing any of the WORK.

B. Whenever in the Contract Documents the terms "as ordered," "as directed," "as required," "as allowed," "as reviewed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review, or judgment of the ARCHITECT as to the WORK, it is intended that such requirement, direction, review, or judgment will be solely to evaluate the WORK for compliance with the requirements of the Contract Documents, and conformance with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents, unless there is a specific statement indicating otherwise. The use of any such term or adjective shall not be effective to assign to the ARCHITECT any duty or authority to supervise or direct the performance of the WORK or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.9C or 9.9D.

C. The ARCHITECT will not supervise, direct, control, or have authority over or be responsible for the CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of the CONTRACTOR to comply with Laws and Regulations, applicable to the performance of the WORK. The ARCHITECT will not be responsible for the CONTRACTOR's failure to perform the WORK in accordance with the Contract Documents.

D. The ARCHITECT will not be responsible for the acts or omissions of the CONTRACTOR nor of any Subcontractor, Supplier, or any other person or organization performing any of the WORK.

ARTICLE 10 CHANGES IN THE WORK

10.1 GENERAL

A. Without invalidating the Agreement and without notice to any surety, the OWNER may at any time or from time to time, order additions, deletions, or revisions in the WORK; these will be authorized by a written Field Order and/or a Change Order issued by the ARCHITECT.

B. If the CONTRACTOR believes that it is entitled to an increase or decrease in the Contract Price, or an extension or shortening in the Contract Time as the result of a Field Order, a claim may be made as provided in Articles 11 and 12.

C. If the OWNER and CONTRACTOR agree on the value of any WORK, or the amount of Contract Time that should be allowed as a result of a Field Order, upon receiving written notice from the ARCHITECT, the CONTRACTOR shall proceed so as to minimize the impact on and delays to the WORK pending the issuance of a Change Order.

D. If the OWNER and the CONTRACTOR are unable to agree as to the extent, if any, of an increase or decrease in the Contract Price or an extension or shortening of the Contract Time that should be

allowed as a result of a Field Order, the ARCHITECT can direct the CONTRACTOR to proceed on the basis of Time and Materials so as to minimize the impact on and delays to the WORK, and a claim may be made therefor as provided in Articles 11 and 12.

E. The CONTRACTOR shall not be entitled to an increase in the Contract Price nor an extension of the Contract Time with respect to any WORK performed that is not required by the Contract Documents as amended, modified, supplemented by Change Order, except in the case of an emergency and except in the case of uncovering WORK as provided in Paragraph 13.3G.

F. The OWNER and the CONTRACTOR shall execute appropriate Change Orders covering:

1. changes in the WORK which are ordered by the OWNER pursuant to Paragraph 10.1A;
2. changes required because of acceptance of Defective WORK under Paragraph 13.7;
3. changes in the Contract Price or Contract Time which are agreed to by the parties; or
4. changes in the Contract Price or Contract Time which embody the substance of any written decision rendered by the ARCHITECT pursuant to Paragraph 9.8.

G. If notice of any change is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be the CONTRACTOR's responsibility, and the amount of each applicable Bond shall be adjusted accordingly.

10.2 ALLOWABLE QUANTITY VARIATIONS

A. In the event of an increase or decrease in bid item quantity of a unit price contract, the total amount of WORK actually done or materials or equipment furnished shall be paid for according to the unit price established for such WORK under the Contract Documents, wherever such unit price has been established; provided, that an adjustment in the Contract Price may be made for changes which result in an increase or decrease in excess of 25% of the estimated quantity of any major item of the WORK. Major Item is defined as any bid item amount that is ten percent (10%) or more of the total contract amount.

B. In the event a part of the WORK is to be entirely eliminated and no lump sum or unit price is named in the Contract Documents to cover such eliminated WORK, the price of the eliminated WORK shall be agreed upon in writing by the OWNER and the CONTRACTOR. If the OWNER and the CONTRACTOR fail to agree upon the price of the eliminated WORK, said price shall be determined in accordance with the provisions of Article 11.

ARTICLE 11 CHANGE OF CONTRACT PRICE

11.1 GENERAL

A. The Contract Price constitutes the total compensation payable to the CONTRACTOR for performing the WORK. All duties, responsibilities, and obligations assigned to or undertaken by the CONTRACTOR to complete the WORK shall be at its expense without change in the Contract Price.

B. The Contract Price may only be changed by a Change Order. Any claim for an increase in the Contract Price shall be based on written notice delivered by the CONTRACTOR to the ARCHITECT promptly (but in no event later than 30 days) after the start of the occurrence or the event giving rise to the claim

and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within 60 days after such occurrence (unless the ARCHITECT allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the CONTRACTOR's written statement that the amount claimed covers all known amounts (direct, indirect, and consequential) to which the CONTRACTOR is entitled as a result of said occurrence or event. All claims for adjustment in the Contract Price shall be determined by the ARCHITECT in accordance with Paragraph 9.8A if the OWNER and the CONTRACTOR cannot otherwise agree on the amount involved. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this Paragraph 11.1B.

C. The value of any WORK covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

1. Where the WORK involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved.
2. By mutual acceptance of a lump sum, which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.4.
3. On the basis of the "Cost of WORK" (determined as provided in Paragraphs 11.3) plus a CONTRACTOR's fee for overhead and profit (determined as provided in Paragraph 11.4).

11.2 COSTS RELATING TO WEATHER. The CONTRACTOR shall have no claims against the OWNER for damages for any injury to WORK, materials, or equipment, resulting from the action of the elements. If, however, in the opinion of the ARCHITECT, the CONTRACTOR has made all reasonable efforts to protect the materials, equipment and WORK, the CONTRACTOR may be granted a reasonable extension of Contract Time to make proper repairs, renewals, and replacements of the WORK, materials, or equipment.

11.3 COST OF WORK (BASED ON TIME AND MATERIALS)

A. General. The term "Cost of WORK" means the sum of all costs necessarily incurred and paid by the CONTRACTOR for labor, materials, and equipment in the proper performance of extra WORK. Except as otherwise may be agreed to in writing by the OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project; shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.5 EXCLUDED COSTS.

B. Labor. The costs of labor will be the actual cost for wages prevailing for each craft or type of workers performing the extra WORK at the time the extra WORK is done, plus employer payments of payroll taxes, worker’s compensation insurance, liability insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State or local laws, as well as assessments or benefits required by lawful collective bargaining agreements. Labor costs for equipment operators and helpers shall be paid only when such costs are not included in the invoice for equipment rental. The labor costs for forepersons shall be proportioned to all of their assigned WORK and only that applicable to extra WORK shall be paid. Non-direct labor costs including superintendence shall be considered part of the mark-up set out in paragraph 11.4.

C. Materials. The cost of materials reported shall be at invoice or lowest current price at which materials are locally available and delivered to the job in the quantities involved, plus the cost of freight, delivery and storage, subject to the following:

1. Trade discounts available to the purchaser shall be credited to the OWNER notwithstanding the fact that such discounts may not have been taken by the CONTRACTOR.
2. For materials secured by other than a direct purchase and direct billing to the purchaser, the cost shall be deemed to be the price paid to the actual supplier as determined by the ARCHITECT. Mark-up except for actual costs incurred in the handling of such materials will not be allowed.
3. Payment for materials from sources owned wholly or in part by the purchaser shall not exceed the price paid by the purchaser for similar materials from said sources on extra WORK items or the current wholesale price for such materials delivered to the WORK site, whichever price is lower.
4. If in the opinion of the ARCHITECT the cost of material is excessive, or the CONTRACTOR does not furnish satisfactory evidence of the cost of such material, then the cost shall be deemed to be the lowest current wholesale price for the quantity concerned delivered to the WORK site less trade discount. The OWNER reserves the right to furnish materials for the extra WORK and no claim shall be allowed by the CONTRACTOR for costs and profit on such materials.

D. Equipment. The CONTRACTOR will be paid for the use of equipment at the rental rate listed for such equipment specified in the Supplementary General Conditions. Such rental rate will be used to compute payments for equipment whether the equipment is under the CONTRACTOR's control through direct ownership, leasing, renting, or another method of acquisition. The rental rate to be applied for use of each item of equipment shall be the rate resulting in the least total cost to the OWNER for the total period of use. If it is deemed necessary by the CONTRACTOR to use equipment not listed in the publication specified in the Supplementary General Conditions, an equitable rental rate for the equipment will be established by the ARCHITECT. The CONTRACTOR may furnish cost data which might assist the ARCHITECT in the establishment of the rental rate.

1. All equipment shall, in the opinion of the ARCHITECT, be in good working condition and suitable for the purpose for which the equipment is to be used.
2. Before construction equipment is used on the extra WORK, the CONTRACTOR shall plainly stencil or stamp an identifying number thereon at a conspicuous location, and shall furnish to the ARCHITECT, in duplicate, a description of the equipment and its identifying number.
3. Unless otherwise specified, manufacturer's ratings and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.
4. Individual pieces of equipment or tools having a replacement value of $200 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefor.
5. Rental time will not be allowed while equipment is inoperative due to breakdowns.
6. Equipment. Unless otherwise agreed to in writing, the CONTRACTOR will be paid for the use of equipment at the rental rate listed for such equipment specified in the current edition of the following reference publication: “Rental Rate Blue Book” available on-line at http://www.equipmentwatch.com/rrbb.htm or contact Equipment Watch at (800) 669-3282.

E. Equipment on the WORK Site. The rental time to be paid for equipment on the WORK site shall be the time the equipment is in productive operation on the extra WORK being performed and, in addition, shall include the time required to move the equipment to the location of the extra WORK and return it to the original location or to another location requiring no more time than that required to return it to its original location; except, that moving time will not be paid if the equipment is used on other than the extra WORK, even though located at the site of the extra WORK. Loading and

transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power, except that no payment will be made for loading and transporting costs when the equipment is used at the site of the extra WORK on other than the extra WORK. The following shall be used in computing the rental time of equipment on the WORK site.

1. When hourly rates are listed, any part of an hour less than 30 minutes of operation shall be considered to be 1/2-hour of operation, and any part of an hour in excess of 30 minutes will be considered one hour of operation.
2. When daily rates are listed, any part of a day less than 4 hours operation shall be considered to be 1/2-day of operation. When owner-operated equipment is used to perform extra WORK to be paid for on a time and materials basis, the CONTRACTOR will be paid for the equipment and operator, as set forth in Paragraphs (3), (4), and (5), following.
3. Payment for the equipment will be made in accordance with the provisions in Paragraph 11.3D, herein.
4. Payment for the cost of labor and subsistence or travel allowance will be made at the rates paid by the CONTRACTOR to other workers operating similar equipment already on the WORK site, or in the absence of such labor, established by collective bargaining agreements for the type of worker and location of the extra WORK, whether or not the operator is actually covered by such an agreement. A labor surcharge will be added to the cost of labor described herein in accordance with the provisions of Paragraph 11.3B, herein, which surcharge shall constitute full compensation for payments imposed by state and federal laws and all other payments made to or on behalf of workers other than actual wages.
5. To the direct cost of equipment rental and labor, computed as provided herein, will be added the allowances for equipment rental and labor as provided in Paragraph 11.4, herein.

F. Specialty WORK. Specialty WORK is defined as that WORK characterized by extraordinary complexity, sophistication, or innovation or a combination of the foregoing attributes which are unique to the construction industry. The following shall apply in making estimates for payment for specialty WORK:

1. Any bid item of WORK to be classified as Specialty WORK shall be listed as such in the Supplementary General Conditions. Specialty WORK shall be performed by an entity especially skilled in the work to be performed. After validation of invoices and determination of market values by the ARCHITECT, invoices for Specialty WORK based upon the current fair market value thereof may be accepted without complete itemization of labor, material, and equipment rental costs.
2. When the CONTRACTOR is required to perform WORK necessitating special fabrication or machining process in a fabrication or a machine shop facility away from the job site, the charges for that portion of the WORK performed at the off-site facility may, by agreement, be accepted as Specialty WORK and accordingly, the invoices for the WORK may be accepted without detailed itemization.
3. All invoices for specialty WORK will be adjusted by deducting all trade discounts offered or available, whether the discounts were taken or not. In lieu of the allowances for overhead and profit specified in Paragraph 11.4, herein, an allowance of 5 percent will be added to invoices for specialty WORK.

G. Sureties. All WORK performed hereunder shall be subject to all of the provisions of the Contract Documents and the CONTRACTOR's sureties shall be bound with reference thereto as under the

original Agreement. Copies of all amendments to surety Bonds or supplemental surety Bonds shall be submitted to the OWNER for review prior to the performance of any WORK hereunder.

11.4 CONTRACTOR'S FEE

A. Extra WORK ordered on the basis of time and materials will be paid for at the actual necessary cost as determined by the ARCHITECT, plus allowances for overhead and profit. The allowance for overhead and profit shall include full compensation for superintendence, Bond and insurance premiums, taxes, field office expense, extended overhead, home office overhead, and all other items of expense or cost not included in the cost of labor, materials, or equipment provided for under Paragraph 11.3. The allowance for overhead and profit will be made in accordance with the following schedule:

Actual Overhead and Profit Allowance

Labor .....15 percent
Materials.....10 percent
Equipment .....10 percent

To the sum of the costs and mark-ups provided for in this Article, one (1) percent shall be added as compensation for Bonds.

B. It is understood that labor, materials, and equipment may be furnished by the CONTRACTOR or by the Subcontractor on behalf of the CONTRACTOR. When all or any part of the extra WORK is performed by a Subcontractor, the allowance specified herein shall be applied to the labor, materials, and equipment costs of the Subcontractor, to which the CONTRACTOR may add five (5) percent of the Subcontractor's total cost for the extra WORK. Regardless of the number of hierarchical tiers of Subcontractors, the five (5) percent increase above the Subcontractor's total cost which includes the allowances for overhead and profit specified herein may be applied one time only.

11.5 EXCLUDED COSTS.

A. The term "Cost of the WORK" shall not include any of the following:

1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, architects, estimators, attorneys' auditors, accountants, purchasing and contracting agents, expenditures, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR's principal or a branch office for general administration of the WORK, or not specifically covered by paragraph 11.3, all of which are to be considered administrative costs covered by the CONTRACTOR's fee.
2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.
3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the WORK and charges against CONTRACTOR for delinquent payments.
4. Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by paragraph 11.4 above).
5. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but

not limited to, the correction of Defective WORK, disposal of materials or equipment wrongly supplied and making good any damage to property.

6. Other overhead or general expense costs of any kind and the cost of any item not specifically and expressly included in paragraph 11.4.

ARTICLE 12 CHANGE OF CONTRACT TIME

12.1 GENERAL

A. The Contract Time may only be changed by a Change Order. Any claim for an extension of the Contract Time (or Milestones) shall be based on written notice delivered by the CONTRACTOR to the ARCHITECT promptly (but in no event later than 30 days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within 60 days after such occurrence (unless the ARCHITECT allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the CONTRACTOR's written statement that the adjustment claimed is the entire adjustment to which the CONTRACTOR has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by the ARCHITECT in accordance with Paragraph 9.8 if the OWNER and the CONTRACTOR cannot otherwise agree. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph. An increase in Contract Time does not mean that the CONTRACTOR is due an increase in Contract Price. Only Compensable time extensions will result in an increase in Contract Price.

B. All time limits stated in the Contract Documents are of the essence of the Agreement.

C. Where CONTRACTOR is prevented from completing any part of the WORK within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost on the critical path of the Project due to such delay if a claim is made therefor as provided in paragraph 12.1. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, unprecedented weather conditions or acts of God. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

D. Where CONTRACTOR is prevented from completing any part of the WORK within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost on the critical path of the Project due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay. In no event shall the OWNER be liable to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from (i) delays caused by or within the control of CONTRACTOR, or (ii) delays beyond the control of both parties including but not limited to fires, floods, epidemics abnormal weather conditions, acts of God or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.

12.2 EXTENSIONS OF TIME FOR DELAY DUE TO WEATHER. Contract time may be extended by the ARCHITECT because of delays in completion of the WORK due to unusually severe weather, provided that the CONTRACTOR shall, within 10 days of the beginning of any such delay, notify the ARCHITECT in writing of the cause of delay and request an extension of contract time. The ARCHITECT will ascertain the facts and the extent of the delay and extend the time for completing the WORK when, in the ARCHITECT's judgment, the findings of fact justify such an extension. Unprecedented, abnormal, or unusually severe weather will be defined as an event, or events, with a greater than 50-year recurrence interval, as determined by the National Weather Service, or equivalent state or federal agency.

ARTICLE 13 WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

13.1 WARRANTY AND GUARANTEE. The CONTRACTOR warrants and guarantees to the OWNER and the ARCHITECT that all WORK will be in accordance with the Contract Documents and will not be defective. Prompt notice of defects known to the OWNER or ARCHITECT shall be given to the CONTRACTOR. All Defective WORK, whether or not in place, may be rejected, corrected, or accepted as provided in this Article 13.

13.2 ACCESS TO WORK. The OWNER, ARCHITECT, Architect of Record, their consultants, sub-consultants, other representatives and personnel of OWNER, independent testing laboratories and governmental agencies with jurisdictional interests will have access to the WORK at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's site safety procedures and programs so that they may comply therewith as applicable.

13.3 INSPECTIONS AND TESTS

A. The CONTRACTOR shall give the ARCHITECT timely notice of readiness of the WORK for all required inspections, tests, or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. If Laws or Regulations of any public body having jurisdiction other than the OWNER require any WORK to specifically be inspected, tested, or approved, the CONTRACTOR shall pay all costs in connection therewith. The CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with the OWNER's or the ARCHITECT's acceptance of a Supplier of materials or equipment proposed as a substitution or (or-equal) to be incorporated in the WORK, or of materials or equipment submitted for review prior to the CONTRACTOR's purchase thereof for incorporation in the WORK. The cost of all inspections, tests, and approvals in addition to the above which are required by the Contract Documents shall be paid by the OWNER (unless otherwise specified).

C. The ARCHITECT will make, or have made, such inspections and tests as the ARCHITECT deems necessary to see that the WORK is being accomplished in accordance with the requirements of the Contract Documents. Unless otherwise specified in the Supplementary General Conditions, the cost of such inspection and testing will be borne by the OWNER. In the event such inspections or tests reveal non-compliance with the requirements of the Contract Documents, the CONTRACTOR shall bear the cost of corrective measures deemed necessary by the ARCHITECT, as well as the cost of subsequent re-inspection and retesting. Neither observations by the ARCHITECT nor inspections, tests, or

approvals by others shall relieve the CONTRACTOR from the CONTRACTOR's obligation to perform the WORK in accordance with the Contract Documents.

D. All inspections, tests, or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by organizations acceptable to the ARCHITECT and the CONTRACTOR.

E. If any WORK (including the work of others anticipated under paragraph 7.1) that is to be inspected, tested, or approved is covered without written concurrence of the ARCHITECT, it must, if requested by the ARCHITECT, be uncovered for observation. Such uncovering shall be at the CONTRACTOR's expense unless the CONTRACTOR has given the ARCHITECT timely notice of the CONTRACTOR's intention to perform such test or to cover the same and the ARCHITECT has not acted with reasonable promptness in response to such notice.

F. If any WORK is covered contrary to the written request of the ARCHITECT, it must, if requested by the ARCHITECT, be uncovered for the ARCHITECT's observation and recovered at the CONTRACTOR's expense.

G. If the ARCHITECT considers it necessary or advisable that covered WORK be observed by the ARCHITECT or inspected or tested by others, the CONTRACTOR, at the ARCHITECT's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as the ARCHITECT may require, that portion of the WORK in question, furnishing all necessary labor, material, and equipment. If it is found that such WORK is defective, the CONTRACTOR shall bear all direct, indirect, and consequential costs and damages of such uncovering, exposure, observation, inspection, and testing and of satisfactory reconstruction, including but not limited to fees and charges of Architects of Record, attorneys, and other professionals. However, if such WORK is not found to be defective, the CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, and reconstruction; and, if the parties are unable to agree as to the amount or extent thereof, the CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

13.4 OWNER MAY STOP THE WORK. If the WORK is defective, or the CONTRACTOR fails to perform WORK in such a way that the completed WORK will conform to the Contract Documents, the OWNER may order the CONTRACTOR to stop the WORK, or any portion thereof, until the cause for such order has been eliminated; however, this right of the OWNER to stop the WORK shall not give rise to any duty on the part of the OWNER to exercise this right for the benefit of the CONTRACTOR or any other party.

13.5 CORRECTION OR REMOVAL OF DEFECTIVE WORK. If required by the ARCHITECT, the CONTRACTOR shall promptly, either correct all Defective WORK, whether or not fabricated, installed, or completed, or, if the WORK has been rejected by the ARCHITECT, remove it from the site and replace it with non-defective WORK. The CONTRACTOR shall bear all direct, indirect and consequential costs and damages of such correction or removal, including but not limited to fees and charges of Architects of Record, attorneys, and other professionals made necessary thereby.

13.6 ONE YEAR CORRECTION PERIOD

A. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations 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 is found to be defective, the CONTRACTOR shall promptly, without cost to the OWNER and in accordance with OWNER's written notification, (i) correct such Defective WORK, or, if it has been rejected by the OWNER, remove it from the site and replace it with non-defective WORK, and (ii) satisfactorily correct or remove and replace any damage to other work of others resulting therefrom. If the CONTRACTOR does not promptly comply with such notification, 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 and damages of such removal and replacement including but not limited to fees and charges of Architects of Record, attorneys and other professionals will be paid by the CONTRACTOR.

B. Where Defective WORK (and damage to other WORK resulting therefrom) has been corrected, removed or replaced under this paragraph 13.6, the correction period hereunder with respect to such WORK will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

13.7 ACCEPTANCE OF DEFECTIVE WORK. If, instead of requiring correction or removal and replacement of Defective WORK, the OWNER prefers to accept the WORK, the OWNER may do so. The CONTRACTOR shall bear all direct, indirect, and consequential costs attributable to the OWNER's evaluation of and determination to accept such Defective WORK. If any such acceptance occurs prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the WORK, and the OWNER shall be entitled to an appropriate decrease in the Contract Price.

ARTICLE 14 PAYMENTS TO CONTRACTOR AND COMPLETION

14.1 SCHEDULE OF VALUES (LUMP SUM PRICE BREAKDOWN). The Schedule of Values or lump sum price breakdown established as provided in the General Requirements shall serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to the ARCHITECT.

14.2 UNIT PRICE BID SCHEDULE. Progress payments on account of Unit Price WORK will be based on the number of units completed.

14.3 APPLICATION FOR PROGRESS PAYMENT

A. Unless otherwise prescribed by law, on the 25th of each month, the CONTRACTOR shall submit to the ARCHITECT for review, an Application for Payment filled out and signed by the CONTRACTOR covering the WORK completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.

B. The Application for Payment shall identify, as a sub-total, the amount of the CONTRACTOR's Total Earnings to Date, plus the Value of Materials Stored at the Site which have not yet been incorporated in the WORK, and less a deductive adjustment for materials installed which were not previously incorporated in the WORK, but for which payment was allowed under the provisions for payment for Materials Stored at the Site, but not yet incorporated in the WORK.

C. The Net Payment Due the CONTRACTOR shall be the above-mentioned subtotal from which shall be deducted the total amount of all previous payments made to the CONTRACTOR. Progress payments

will be paid in full in accordance with Article 14 of the General Conditions until 90% of the contract amount has been paid. The remaining 10% of the contract amount shall be retained until:

1. final inspection has been made;
2. completion of the project;
3. acceptance of the project by the OWNER and;
4. the OWNER has received notification from the Alaska Department of Labor that the CONTRACTOR has no outstanding wage/hour violations.

D. The Value of Materials Stored at the Site shall be an amount equal to the specified percent of the value of such materials as set forth in the Supplementary General Conditions. Said amount shall be based upon the value of all acceptable materials and equipment not incorporated in the WORK but delivered and suitably stored at the Project site or at another location agreed to in writing; provided, each such individual item has a value of more than $5000 and will become a permanent part of the WORK. The Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that the CONTRACTOR has received the materials and equipment free and clear of all liens, charges, security interests, and encumbrances (which are hereinafter in these General Conditions referred to as "Liens") and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect the OWNER's interest therein, all of which will be satisfactory to the OWNER.

14.4 CONTRACTOR'S WARRANTY OF TITLE. The CONTRACTOR warrants and guarantees that title to all WORK, materials, and equipment covered by an Application for Payment, whether incorporated in the WORK or not, will pass to the OWNER no later than the time of payment free and clear of all liens.

14.5 REVIEW OF APPLICATIONS FOR PROGRESS PAYMENT

A. The ARCHITECT will, within seven (7) days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to the OWNER, or return the Application to the CONTRACTOR indicating in writing the ARCHITECT's reasons for refusing to recommend payment. In the later case, the CONTRACTOR may make the necessary corrections and resubmit the Application. If the ARCHITECT still disagrees with a portion of the Application, it will submit the Application recommending the undisputed portion of the Application to the OWNER for review and provide reasons for recommending non-payment of the disputed amount. Thirty days after presentation of the Application for Payment with the ARCHITECT's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.5B) become due and when due will be paid by the OWNER to the CONTRACTOR.

B. The OWNER may refuse to make payment of the full amount recommended by the ARCHITECT because claims have been made against the OWNER on account of the CONTRACTOR's performance of the WORK or Liens have been filed in connection with the WORK or there are other items entitling the OWNER to a credit against the amount recommended, but the OWNER must give the CONTRACTOR written notice within seven (7) days (with a copy to the ARCHITECT) stating the reasons for such action.

14.6 PARTIAL UTILIZATION

A. The OWNER shall have the right to utilize or place into service any item of equipment or other usable portion of the WORK prior to completion of the WORK. Whenever the OWNER plans to exercise said right, the CONTRACTOR will be notified in writing by the OWNER, identifying the specific portion or portions of the WORK to be so utilized or otherwise placed into service.

B. It shall be understood by the CONTRACTOR that until such written notification is issued, all responsibility for care and maintenance of all of the WORK shall be borne by the CONTRACTOR. Upon issuance of said written notice of partial utilization, the OWNER will accept responsibility for the protection and maintenance of all such items or portions of the WORK described in the written notice.

C. The CONTRACTOR shall retain full responsibility for satisfactory completion of the WORK, regardless of whether a portion thereof has been partially utilized by the OWNER and the CONTRACTOR's one year correction period shall commence only after the date of Substantial Completion for the WORK.

14.7 SUBSTANTIAL COMPLETION. When the CONTRACTOR considers the WORK ready for its intended use the CONTRACTOR shall notify the OWNER and the ARCHITECT in writing that the WORK is substantially complete. The CONTRACTOR will attach to this request a list of all WORK items that remain to be completed and a request that the ARCHITECT prepare a Notice of Completion. Within a reasonable time thereafter, the OWNER, the CONTRACTOR, and the ARCHITECT shall make an inspection of the WORK to determine the status of completion. If the ARCHITECT does not consider the WORK substantially complete, or the list of remaining WORK items to be comprehensive, the ARCHITECT will notify the CONTRACTOR in writing giving the reasons thereof. If the ARCHITECT considers the WORK substantially complete, the ARCHITECT will prepare and deliver to the OWNER, for its execution and recording, the Notice of Completion signed by the ARCHITECT and CONTRACTOR, which shall fix the date of Substantial Completion.

14.8 FINAL APPLICATION FOR PAYMENT. After the CONTRACTOR has completed all of the remaining WORK items referred to in Paragraph 14.7 and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, record as-built documents (as provided in the General Requirements) and other documents, all as required by the Contract Documents, and after the ARCHITECT has indicated that the WORK is acceptable, the CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to the OWNER) of all liens arising out of or filed in connection with the WORK.

14.9 FINAL PAYMENT AND ACCEPTANCE

A. If, on the basis of the ARCHITECT's observation of the WORK during construction and final inspection, and the ARCHITECT's review of the final Application for Payment and accompanying documentation, all as required by the Contract Documents, the ARCHITECT is satisfied that the WORK has been completed and the CONTRACTOR's other obligations under the Contract Documents have been fulfilled, the ARCHITECT will, within 14 days after receipt of the final Application for Payment, indicate in writing the ARCHITECT's recommendation of payment and present the Application to the OWNER for payment.

B. After acceptance of the WORK by the OWNER's governing body, the OWNER will make final payment to the CONTRACTOR of the amount remaining after deducting all prior payments and all amounts to be kept or retained under the provisions of the Contract Documents, including the following items:

1. Liquidated damages, as applicable.
2. Two times the value of outstanding items of correction WORK or punch list items yet uncompleted or uncorrected, as applicable. All such WORK shall be completed or corrected to the satisfaction of the OWNER within the time stated on the Notice of Completion, otherwise the CONTRACTOR does hereby waive any and all claims to all monies withheld by the OWNER to cover the value of all such uncompleted or uncorrected items.

14.10 RELEASE OF RETAINAGE AND OTHER DEDUCTIONS

A. After executing the necessary documents to initiate the lien period, and not more than 45 days thereafter (based on a 30-day lien filing period and 15-day processing time), the OWNER will release to the CONTRACTOR the retainage funds withheld pursuant to the Agreement, less any deductions to cover pending claims against the OWNER pursuant to Paragraph 14.5B.

B. After filing of the necessary documents to initiate the lien period, the CONTRACTOR shall have 30 days to complete any outstanding items of correction WORK remaining to be completed or corrected as listed on a final punch list made a part of the Notice of Completion. Upon expiration of the 45 days, referred to in Paragraph 14.10A, the amounts withheld pursuant to the provisions of Paragraph 14.9B herein, for all remaining WORK items will be returned to the CONTRACTOR; provided, that said WORK has been completed or corrected to the satisfaction of the OWNER within said 30 days. Otherwise, the CONTRACTOR does hereby waive any and all claims for all monies withheld by the OWNER under the contract to cover 2 times the value of such remaining uncompleted or uncorrected items.

14.11 CONTRACTOR'S CONTINUING OBLIGATION. The CONTRACTOR's obligation to perform and complete the WORK in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by the ARCHITECT, nor the issuance of a Notice of Completion, nor any payment by the OWNER to the CONTRACTOR under the Contract Documents, nor any use or occupancy of the WORK or any part thereof by the OWNER, nor any act of acceptance by the OWNER nor any failure to do so, nor any review of a Shop Drawing or sample submittal, will constitute an acceptance of WORK not in accordance with the Contract Documents or a release of the CONTRACTOR's obligation to perform the WORK in accordance with the Contract Documents.

14.12 FINAL PAYMENT TERMINATES LIABILITY OF OWNER. Final payment is defined as the last progress payment made to the CONTRACTOR for earned funds, less monies withheld as applicable, pursuant to Paragraph 14.10A. The acceptance by the CONTRACTOR of the final payment referred to in Paragraph 14.9 herein, shall be a release of the OWNER and its agents from all claims of liability to the CONTRACTOR for anything done or furnished for, or relating to, the WORK or for any act of neglect of the OWNER or of any person relating to or affecting the WORK, except demands against the OWNER for the remainder, if any, of the amounts kept or retained under the provisions of Paragraph 14.9 herein; and excepting pending, unresolved claims filed prior to the date of the Notice of Completion.

ARTICLE 15 SUSPENSION OF WORK AND TERMINATION

15.1 SUSPENSION OF WORK BY OWNER. The OWNER, acting through the ARCHITECT, may, at any time and without cause, suspend the WORK or any portion thereof for a period of not more than 90 days by notice in writing to the CONTRACTOR. The CONTRACTOR shall resume the WORK on receipt from the ARCHITECT of a notice of resumption of WORK. The CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if the CONTRACTOR makes an approved claim therefor as provided in Articles 11 and 12.

15.2 TERMINATION OF AGREEMENT BY OWNER (CONTRACTOR DEFAULT)

A. In the event of default by the CONTRACTOR, the OWNER may give 10 days written notice to the CONTRACTOR of OWNER's intent to terminate the Agreement and provide the CONTRACTOR an opportunity to remedy the conditions constituting the default. It shall be considered a default by the CONTRACTOR whenever CONTRACTOR shall: (1) declare bankruptcy, become insolvent, or assign its assets for the benefit of its creditors; (2) fail to provide materials or quality of WORK meeting the requirements of the Contract Documents; (3) disregard or violate provisions of the Contract Documents or ARCHITECT's instructions; (4) fail to prosecute the WORK according to the approved progress schedule; or, (5) fail to provide a qualified superintendent, competent workers, or materials or equipment meeting the requirements of the Contract Documents. If the CONTRACTOR fails to remedy the conditions constituting default within the time allowed, the OWNER may then issue the Notice of Termination.

B. In the event the Agreement is terminated in accordance with Paragraph 15.2A, herein, the OWNER may take possession of the WORK and may complete the WORK by whatever method or means the OWNER may select. The cost of completing the WORK shall be deducted from the balance which would have been due the CONTRACTOR had the Agreement not been terminated and the WORK completed in accordance with the Contract Documents. If such cost exceeds the balance which would have been due, the CONTRACTOR shall pay the excess amount to the OWNER. If such cost is less than the balance which would have been due, the CONTRACTOR shall not have claim to the difference.

15.3 TERMINATION OF AGREEMENT BY OWNER (FOR CONVENIENCE). The OWNER may terminate the Agreement at any time if it is found that reasons beyond the control of either the OWNER or CONTRACTOR make it impossible or against the OWNER's interests to complete the WORK. In such a case, the CONTRACTOR shall have no claims against the OWNER except: (1) for the value of WORK performed up to the date the Agreement is terminated; and, (2) for the cost of materials and equipment on hand, in transit, or on definite commitment, as of the date the Agreement is terminated, which would be needed in the WORK and which meet the requirements of the Contract Documents. The value of WORK performed and the cost of materials and equipment delivered to the site, as mentioned above, shall be determined by the ARCHITECT in accordance with the procedure prescribed for the making of the final Application for Payment and payment under Paragraphs 14.8 and 14.9.

15.4 TERMINATION OF AGREEMENT BY CONTRACTOR. The CONTRACTOR may terminate the Agreement upon 10 days written notice to the OWNER, whenever: 1) the WORK has been suspended under the provisions of Paragraph 15.1, herein, for more than 90 consecutive days through no fault or

negligence of the CONTRACTOR, and notice to resume WORK or to terminate the Agreement has not been received from the OWNER within this time period; or, 2) the OWNER should fail to pay the CONTRACTOR any monies due to the CONTRACTOR in accordance with the terms of the Contract Documents and within 60 days after presentation to the OWNER by the CONTRACTOR of a request therefor, unless within said 10-day period the OWNER shall have remedied the condition upon which the payment delay was based. In the event of such termination, the CONTRACTOR shall have no claims against the OWNER except for those claims specifically enumerated in Paragraph 15.3, herein, and as determined in accordance with the requirements of said paragraph.

ARTICLE 16 MISCELLANEOUS

16.1 GIVING NOTICE. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

16.2 RIGHTS IN AND USE OF MATERIALS FOUND ON THE WORK

A. The CONTRACTOR may use on the Project, with ARCHITECT's approval, such stone, gravel, sand, or other material determined suitable by the ARCHITECT, as may be found in the excavation. The CONTRACTOR will be paid for the excavation of such material at the corresponding contract unit price. No additional payment will be made for utilizing the material from excavation as borrow, or select borrow.

B. The CONTRACTOR shall replace, at its own expense, with other acceptable material, all of that portion of the excavated material so removed and used which was needed for use on the Project. No charge for the materials so used will be made against the CONTRACTOR except that the CONTRACTOR shall be responsible for payment of any royalties required.

C. The CONTRACTOR shall not excavate or remove any material from within the Project location which is not within the grading limits, as indicated by the slope and grade lines, without written authorization from the ARCHITECT.

D. In the event the CONTRACTOR has processed materials from OWNER-furnished sources in excess of the quantities required for performance of this contract, including any waste material produced as a by-product, the CBJ may retain possession of such materials without obligation to reimburse the CONTRACTOR for the cost of their production. When such materials are in a stockpile, the ARCHITECT may require: that it remain in stockpile; the CONTRACTOR level such stockpile(s); or that the CONTRACTOR remove such materials and restore the premises to a satisfactory condition at the CONTRACTOR's expense. This provision shall not preclude the CBJ from arranging with the CONTRACTOR to produce material over and above the contract needs, payment for which shall be by written agreement between the CBJ and the CONTRACTOR.

E. Unless otherwise provided, the material from any existing old structure may be used temporarily by the CONTRACTOR in the erection of the new structure. Such material shall not be cut or otherwise damaged except with the approval of the ARCHITECT.

16.3 RIGHT TO AUDIT. If the CONTRACTOR submits a claim to the OWNER for additional compensation, the OWNER shall have the right, as a condition to considering the claim, and as a basis for evaluation of the claim, and until the claim has been settled, to audit the CONTRACTOR's books to the extent they are relevant. This right shall include the right to examine books, records, documents, and other evidence and accounting procedures and practices, sufficient to discover and verify all direct and indirect costs of whatever nature claimed to have been incurred or anticipated to be incurred and for which the claim has been submitted. The right to audit shall include the right to inspect the CONTRACTOR's plants, or such parts thereof, as may be or have been engaged in the performance of the WORK. The CONTRACTOR further agrees that the right to audit encompasses all subcontracts and is binding upon Subcontractors. The rights to examine and inspect herein provided for shall be exercisable through such representatives as the OWNER deems desirable during the CONTRACTOR's normal business hours at the office of the CONTRACTOR. The CONTRACTOR shall make available to the OWNER for auditing, all relevant accounting records and documents, and other financial data, and upon request, shall submit true copies of requested records to the OWNER.

16.4 ARCHAEOLOGICAL OR HISTORICAL DISCOVERIES. When the CONTRACTOR's operation encounters prehistoric artifacts, burials, remains of dwelling sites, paleontological remains, such as shell heaps, land or sea mammal bones or tusks, or other items of historical significance, the CONTRACTOR shall cease operations immediately and notify the ARCHITECT. No artifacts or specimens shall be further disturbed or removed from the ground and no further operations shall be performed at the site until so directed. Should the ARCHITECT order suspension of the CONTRACTOR's operations in order to protect an archaeological or historical finding, or order the CONTRACTOR to perform extra WORK, such order(s) shall be covered by an appropriate contract change document.

16.5 CONSTRUCTION OVER OR ADJACENT TO NAVIGABLE WATERS. All WORK over, on, or adjacent to navigable waters shall be so conducted that free navigation of the waterways will not be interfered with and the existing navigable depths will not be impaired, except as allowed by permit issued by the U.S. Coast Guard and/or the U.S. Army Corps of Engineers, as applicable.

16.6 GRATUITY AND CONFLICT OF INTEREST. The CONTRACTOR agrees to not extend any loan, gratuity or gift of money of any form whatsoever to any employee or elected official of the OWNER, nor will the CONTRACTOR rent or purchase any equipment or materials from any employee or elected official of the OWNER, or to the best of the CONTRACTOR’s knowledge, from any agent of any employee or elected official of the OWNER. Before final payment, the CONTRACTOR shall execute and furnish the OWNER an affidavit certifying that the CONTRACTOR has complied with the above provisions of the contract.

16.7 SUITS OF LAW CONCERNING THE WORK

A. Should a suit of law be entered into, either by the CONTRACTOR (or the CONTRACTOR's surety) against the OWNER, or by the OWNER against the CONTRACTOR (or the CONTRACTOR's surety), the suit of law shall be tried in the First Judicial District of Alaska.

B. If one of the questions at issue is the satisfactory performance of the WORK by the CONTRACTOR and should the appropriate court of law judge the WORK of the CONTRACTOR to be unsatisfactory, then the CONTRACTOR (or the CONTRACTOR's surety) shall reimburse the OWNER for all legal and all other expenses (as may be allowed and set by the court) incurred by the OWNER because of

the suit of the law and, further, it is agreed that the OWNER may deduct such expense from any sum or sums then, or any that become due the CONTRACTOR under the contract.

16.8 CERTIFIED PAYROLLS

A. All CONTRACTORs or Subcontractor who perform work on a public construction contract for the OWNER shall file a Certified Payroll with the Alaska Department of Labor every two weeks. Before the second Friday, each CONTRACTOR and Subcontractor must file Certified Payrolls with Statements of Compliance for the previous two weeks. (Section 14-2-4 ACLA 1949; am Section 4 ch 142 SLA 1972).

B. In lieu of submitting the State payroll form, the CONTRACTOR's standard payroll form may be submitted, provided it contains the information required by AS 36.05.040 and a statement that the CONTRACTOR is complying with AS 36.10.010.

C. Any CONTRACTOR or Subcontractor, who performs work on public construction in the State, as defined by AS 36.95.010(3), shall pay not less than the current prevailing rate of wages as issued by the Alaska Department of Labor before the end of the pay period. (AS 36.05.010).

16.9 PREVAILING WAGE RATES

A. Wage rates for Laborers and Mechanics on Public Contracts, AS 36.05.070. The CONTRACTOR, or Subcontractors, shall pay all employees unconditionally and not less than once a week. Wages may not be less than those stated in Paragraph 16.8C, regardless of the contractual relationship between the CONTRACTOR or Subcontractors and laborers, mechanics, or field surveyors. The scale of wages to be paid shall be posted by the CONTRACTOR in a prominent, easily accessible place at the site of the WORK.

B. Failure to Pay Agreed Wages, AS 36.05.080. 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 or wages less than the established rate, the OWNER may, by written notice, terminate the CONTRACTOR or Subcontractors right to proceed with the WORK. The OWNER may prosecute the WORK to completion by contract or otherwise, and the CONTRACTOR and sureties will be held liable to the OWNER for excess costs for completing the WORK. (Section 2 ch 52 SLA 1959).

C. Listing CONTRACTORS Who Violate contracts, AS 36.05.090. In addition, a list giving the names of persons who have disregarded the rights of their employees shall be distributed to all departments of State government and all political subdivisions. No person appearing on this list, and no firm, corporation, partnership or association in which the person has an interest, may 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. (Section 3 ch 52 SLA 1959; am Section 9 ch 142 SLA).

16.10 EMPLOYMENT REFERENCE. Workers employed in the execution of the contract by the CONTRACTOR or by any Subcontractor under this contract shall not be required or permitted to labor more than 8 hours a day or 40 hours per week in violation of the provisions of the Alaska Wage and Hour Act, Section 23.10.060.

16.11 COST REDUCTION INCENTIVE

A. At any time within 45 days after the date of the Notice of Award, the CONTRACTOR may submit to the ARCHITECT in writing, proposals for modifying the plans, specifications, or other requirements of this contract for the sole purpose of reducing the total cost of construction. The cost reduction proposal shall not impair in any manner the essential functions or characteristics of the project, including but not limited to, service life, economy of operation, ease of maintenance, desired appearance or design and safety standards.

B. The cost reduction proposal shall contain the following information:

1. Description of both the existing contract requirements for performing the WORK and the proposed changes.
2. An itemization of the contract requirements that must be changed if the proposal is adopted.
3. A detailed estimate of the time required and the cost of performing the WORK under both the existing contract and the proposed change.
4. A statement of the date by which the CONTRACTOR must receive the decision from the OWNER on the cost reduction proposal.
5. The contract items of WORK effected by the proposed changes including any quantity variations.
6. A description and estimate of costs the OWNER may incur in implementing the proposed changes, such as test and evaluation and operating and support costs.
7. A prediction of any effects the proposed change would have on future operations and maintenance costs to the OWNER.

C. The provisions of this section shall not be construed to require the OWNER to consider any cost reduction proposal which may be submitted; nor will the OWNER be liable to the CONTRACTOR for failure to accept or act upon any cost reduction proposal submitted, or for delays to the WORK attributable to the consideration or implementation of any such proposal.

D. If a cost reduction proposal is similar to a change in the plans or Specifications for the Project under consideration by the OWNER at the time the proposal is submitted, the OWNER will not accept such proposal and reserves the right to make such changes without compensation to the CONTRACTOR under the provisions of this section.

E. The CONTRACTOR shall continue to perform the WORK in accordance with the requirements of the contract until an executed Change Order incorporating the cost reduction proposal has been issued. If any executed Change Order has not been issued by the date upon which the CONTRACTOR's cost reduction proposal specifies that a decision should be made by the OWNER, in writing, the cost reduction proposal shall be considered rejected.

F. The OWNER, shall be the sole judge of the acceptability of a cost reduction proposal and of the estimated net savings in Contract Time and construction costs resulting from the adoption of all or any part of such proposal. Should the CONTRACTOR disagree with OWNER's decision on the cost reduction proposal, there is no further consideration. The OWNER reserves the right to make final determination.

G. If the CONTRACTOR's cost reduction proposal is accepted in whole or in part, such acceptance will be made by a Contract Change Order, which specifically states that the change is executed pursuant to

this cost reduction proposal section. Such Change Order shall incorporate the changes in the plans and Specifications which are necessary to permit the cost reduction proposal or such part of it as has been accepted to be put into effect and shall include any conditions upon which the OWNER's approval is based, if such approval is conditional. The Change Order shall also describe the estimated net savings in the cost of performing the WORK attributable to the cost reduction proposal, and shall further provide that the contract cost be adjusted by crediting the OWNER with the estimated net savings amount.

H. Acceptance of the cost reduction proposal and performance of the WORK does not extend the time of completion of the contract, unless specifically provided in the Change Order authorizing the use of the submitted proposal. Should the adoption of the cost reduction proposal result in a Contract Time savings, the total Contract Time shall be reduced by an amount equal to the time savings realized.

I. The amount specified to the CONTRACTOR in the Change Order accepted in the cost reduction proposal shall constitute full compensation for the performance of WORK. No claims for additional costs as a result of the changes specified in the cost reduction proposal shall be allowed.

J. The OWNER reserves the right to adopt and utilize any approved cost reduction proposal for general use on any contract administered when it is determined suitable for such application. Cost reduction proposals identical, similar, or previously submitted will not be accepted for consideration if acceptance and compensation has previously been approved. The OWNER reserves the right to use all or part of any cost reduction proposal without obligation or compensation of any kind to the CONTRACTOR.

K. The CONTRACTOR shall bear the costs, if any, to revise all Bonds and insurance requirements for the Project, to include the cost reduction WORK.

END OF SECTION

SECTION 00800 - SUPPLEMENTARY GENERAL CONDITIONS

GENERAL. These Supplementary General Conditions make additions, deletions, or revisions to the General Conditions as indicated herein. All provisions which are not so added, deleted, or revised remain in full force and effect. Terms used in these Supplementary General Conditions which are defined in the General Conditions have the meanings assigned to them in the General Conditions.

SGC 2.2 COPIES OF DOCUMENTS. ***Add*** the following:

The OWNER shall furnish to the CONTRACTOR up to ten (10) copies of the Contract Documents which may include bound reduced Drawings. The CBJ Contracts Office shall contact the CONTRACTOR after issuance of Notice of Intent to Award to determine how many copies are needed. Additional quantities of the Contract Documents will be furnished at reproduction cost.

SGC 4.2 PHYSICAL CONDITIONS - SUBSURFACE AND EXISTING STRUCTURES. ***Add*** the following:

C. In the preparation of the Contract Documents, the Engineer of Record has relied upon field measurements and visual inspection of the existing structures and surface conditions.

Add the following SGC 4.6**:**

SGC - 4.6 USE OF THE CBJ/STATE LEMON CREEK GRAVEL PIT. ***Add*** the following.

The CBJ/State Lemon Creek Gravel Pit is not available for this Project.

SGC 5.1 PERFORMANCE, PAYMENT, AND OTHER BONDS. The Contractor shall furnish Performance and Payment Bonds in the amount of 100% of the Bid.

SGC 5.2 INSURANCE AMOUNTS. The limits of liability for the insurance required by Paragraph 5.2 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations**.** All certificates of insurance supplied to the OWNER shall state that the OWNER is named as **"Additional Insured for any and all work performed for the City & Borough of Juneau."** The Additional Insured requirement does not apply to Workers Compensation insurance. NOTE: This requirement has changed. The OWNER no longer requires certificates of insurance referencing project names and contract numbers.

Delete paragraph C and ***Replace*** with the following paragraph C:

C. The CONTRACTOR shall furnish the OWNER with certificates showing the type, amount, class of operations covered, effective dates and dates of expiration of policies. Failure of CBJ to demand such certificate or other evidence of full compliance with these insurance requirements or failure of CBJ to identify a deficiency from evidence that is provided shall not be construed as a waiver of the obligation of the Contractor to maintain the insurance required by this contract. The coverage afforded will not be cancelled, reduced in coverage, or renewal refused until at least 30 days' prior written notice has been given to the OWNER by the CONTRACTOR. . All such insurance required herein (except for Workers' Compensation and Employer's Liability) shall name the OWNER, its Consultants and subconsultants and their officers, directors, agents, and employees as "additional insureds" under the policies. The CONTRACTOR shall purchase and maintain the following insurance:

1. Workers' Compensation and Employer's Liability. This insurance shall protect the CONTRACTOR against all claims under applicable state workers' compensation laws. The CONTRACTOR shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a Workers' Compensation law. The CONTRACTOR shall require each Subcontractor similarly to provide Workers' Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the CONTRACTOR's Workers' Compensation Insurance. In case any class of employees is not protected, under the Workers' Compensation Statute, the CONTRACTOR shall provide and shall cause each subcontractor to provide adequate employer's liability insurance for the protection of such of its employees as are not otherwise protected.

A. Workers' Compensation: Under Paragraph 5.2C.1 of the General Conditions as in accordance with AS 23.30.045: (Additional Insured requirements not necessary for Workers' Compensation coverage.)

1. State: Statutory
2. Applicable Federal (e.g., Longshore): Statutory

Note: If the WORK called for in the Contract Documents involves work in or on any navigable waters, the CONTRACTOR shall provide Workers' Compensation coverage which shall include coverage under the Longshore and Harbor Workers' Compensation Act, the Jones Act, and any other coverage required under Federal or State laws pertaining to workers in or on navigable waters.

3. Employer's Liability

Bodily Injury by Accident:	$100,000.00	Each Accident
Bodily Injury by Disease:	$100,000.00	Each Employee
Bodily Injury by Disease:	$500,000.00	Policy Limit

a. CONTRACTOR agrees to waive all rights of subrogation against the OWNER of Record for work performed under contract.
b. If CONTRACTOR directly utilizes labor outside of the State of Alaska in the prosecution of the WORK, "Other States" endorsement shall be required as a condition of the contract.

B. Commercial General Liability: (under Paragraph 5.2C.2 of the General Conditions):

1.	General Policy	$1,000,000.00	Each Occurrence
		$2,000,000.00	Annual Aggregate
2.	Products/Completed Operations	$1,000,000.00	Each Occurrence
		$2,000,000.00	Annual Aggregate
3.	Personal Injury	$1,000,000.00	Each Occurrence

C. Comprehensive Automobile Liability: (under Paragraph 5.2C.3 of the General Conditions) including Owned, Hired, and Non-Owned Vehicles:

1. Combined Single Limit, Bodily Injury and Property Damage $1,000,000.00

The CONTRACTOR shall require each Subcontractor similarly to provide Commercial Automobile Liability Insurance for all of the latter's employees to be engaged in such WORK unless such employees are covered by the protection afforded by the CONTRACTOR's Commercial Automobile Liability Insurance.

D. Builders risk does not apply to this Project.

E. Policies shall also specify insurance provided by CONTRACTOR will be considered primary and not contributory to any other insurance available to the OWNER.

F. Should any of the policies described above be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

SGC 6.1 SUPERVISION AND SUPERINTENDENCE. ***Add*** the following:

D. The CONTRACTOR's superintendent shall attend a weekly progress meeting at the site with the OWNER and/or the ARCHITECT at a time to be mutually agreed upon. The CONTRACTOR's superintendent shall have an operating cellular phone on hand at all times that WORK is performed.

SGC 6.5 CONCERNING SUBCONTRACTORS, SUPPLIERS, AND OTHERS. ***Add*** the following:

The CONTRACTOR shall perform not less than 40% of the WORK with its own forces (i.e., without subcontracting). The 40% requirement shall be understood to mean that the CONTRACTOR shall perform, with its own organization, WORK amounting to at least 40% of the original contract amount. The 40% requirement will be calculated based upon the total of the subcontract amounts submitted for Contract Award, and any other information requested by the OWNER from the apparent low Bidder.

SGC 6.5 CONCERNING SUBCONTRACTORS, SUPPLIERS, AND OTHERS, ***Add*** the following paragraph:

C. CONTRACTOR must pay Subcontractors and/or Suppliers within 30 days of receiving payment from the OWNER, if that payment was made for Work performed by the Subcontractor and/or materials received. Failure to pay Subcontractors within 30 days of receiving payment from which Subcontractor and/or Supplier is to be paid may result in the OWNER initiating debarment proceedings as prescribed in the City and Borough of Juneau Purchasing Code. *The 30 day City and Borough of Juneau requirement does not supersede AS 36.90.210.*

SGC 6.6 PERMITS. ***Add*** the following:

C. The OWNER shall apply for, and obtain, the necessary building permit for this Project; however, the CONTRACTOR is responsible for scheduling and coordinating all necessary inspections. The CBJ Inspection number is 586-1703. All other provisions of this section remain in effect.

D. Contractor is responsible for obtaining a Hot Works permit from the CBJ Permit Center, if performing work which requires such a permit. Work requiring a Hot Works Permit includes but is not limited to

the following: cutting, welding, Thermit welding, brazing, soldering, grinding, thermal spraying, thawing pipe, installation of torch-applied roof systems or any other similar activity.

SGC 6.8 LAWS AND REGULATIONS. ***Add*** the following:

The OWNER may, per AS 36.30, audit the CONTRACTOR's or Subcontractor(s) records that are related to the cost or pricing data for this contract, all related Change Orders, and/or contract modifications.

SGC 6.15 CONTRACTOR'S DAILY REPORTS. ***Add*** the following:

"Weekly summary reports may be completed in lieu of daily reports."

Add the following SCG 6.19:

SGC 6.19 CONTRACTOR'S WORK SCHEDULE LIMITATIONS. Construction of Buildings and Projects. It is unlawful to operate any pile driver, power shovel, pneumatic hammer, derrick, power hoist, or similar heavy construction equipment before 7:00 a.m. or after 10:00 p.m., Monday through Friday, or before 9:00 a.m. or after 10:00 p.m., Saturday and Sunday, unless a permit shall first be obtained from the City and Borough Building Official. Such permit shall be issued by the Building Official only upon a determination that such operation during hours not otherwise permitted hereunder is necessary and will not result in unreasonable disturbance to surrounding residents.

SGC 9.3 PROJECT REPRESENTATION. ***Add*** the following:

DUTIES, RESPONSIBILITIES AND LIMITATIONS OF AUTHORITY OF INSPECTOR

General. The Inspector will act as directed by and under the supervision of the ARCHITECT and will confer with the ARCHITECT regarding its actions. The Inspector's dealings in matters pertaining to the on-site WORK shall, in general, be only with the ARCHITECT and the CONTRACTOR, and dealings with Subcontractors shall only be through or with the full knowledge of the CONTRACTOR. Written communication with the OWNER will be only through or as directed by the ARCHITECT. The ARCHITECT may further delegate the responsibilities and authorities associated with this Project, when such delegation is in writing and notice thereof is provided to the CONTRACTOR.

SGC 11.1 GENERAL. Paragraph B. In the second sentence change the number of days from 30 Days to 7 Days. In the third sentence change the number of days from 60 Days to 14 Days.

SCG 14.3 APPLICATION FOR PROGRESS PAYMENT. ***Delete*** Paragraph C and replace with the following:

C. The Net Payment Due the CONTRACTOR shall be the above-mentioned subtotal from which shall be deducted the total amount of all previous payments made to the CONTRACTOR. Progress payments will be paid in full in accordance with Article 14 of the General Conditions until 90% of the Contract Price has been paid. The remaining 10% of the contract amount may be withheld until:

1. final inspection has been made;
2. completion of the Project; and
3. acceptance of the Project by the OWNER.

SCG 14.3 APPLICATION FOR PROGRESS PAYMENT. Paragraph D.

D. The Value of Materials Stored at the site shall be the amount of 85%.

SGC 14.9 FINAL PAYMENT AND ACCEPTANCE. ***Add*** the following paragraph:

C. Prior to the final payment the CONTRACTOR shall contact the Alaska Department of Labor and Workforce Development (ADOL) and provide the OWNER with clearance from the ADOL for the CONTRACTOR and all Subcontractors that have worked on the Project. This clearance shall indicate that all Employment Security Taxes have been paid. The following page is a sample form for this purpose. The CONTRACTOR also shall submit a "NOTICE OF COMPLETION OF PUBLIC WORKS" signed by ADOL.

D.

SGC 16.8 CERTIFIED PAYROLLS. ***Change*** paragraph A. to read:

A. All CONTRACTORs or Subcontractors who perform work on a public construction contract for the OWNER shall file a certified payroll with Alaska Department of Labor. See Section 00830 - Alaska Labor Standards, Reporting, and Prevailing Wage Rate Determination.

Add the following SGC 17**:**

SGC 17 GENERAL INFORMATION. This Project is currently funded by Bartlett Regional Hospital.

Employment Security Tax Clearance

Date: _____

To: Alaska Department of Labor
Juneau Field Tax Office
907-465-2787
FAX 907-465-2374

From: _____

Subject: BRH OR Ventilation Upgrades
Contract No. E16-095

Timeframe of Contract _____

Please advise whether or not clearance is granted for the following CONTRACTOR or Subcontractor:
(List only one CONTRACTOR or Subcontractor list per page.)

_____ _____
Name Address

Per AS 23.20.265 of the Alaska Employment Security Act, this request is for tax liability clearance and release to make final payment for WORK performed under the subject contract. Please send your response to:

Greg Smith
Engineering Department, Contracts Division
155 S. Seward Street
Juneau, Alaska 99801
FAX 907-586-4530

( ) Tax Clearance is granted.
( ) Tax Clearance is NOT granted.

Remarks: _____

_____ _____
Signature Date

_____
Title

END OF SECTION

SECTION 00830 - ALASKA LABOR STANDARDS, REPORTING, AND PREVAILING WAGE RATE DETERMINATION

State of Alaska, Department of Labor, Laborers' and Mechanics' Minimum Rates of Pay, AS 36.05.010 and AS 36.05.050, Wage and Hour Administration Pamphlet No. 600, the latest edition published by the State of Alaska, Department of Labor inclusive, are made a part of this contract by reference.

The CONTRACTOR is responsible for contacting the Alaska Department of Labor to determine compliance with current regulations.

Correspondence regarding Title 36 requirements may be submitted electronically or paper copies can be submitted by mail. To submit Title 36 documents electronically, go to https://myalaska.state.ak.us/home/app. If filing electronically, submit certified payrolls to ADOL at the website above and email a copy of all certified payrolls to Greg Smith at the email address below. If Contractor elects to submit paper copies, they should be submitted to the physical addresses below.

Within 10 Days of "Notice of Award/Notice to Proceed" make a list of **all** Subcontractors. Include their name, address, phone, estimated subcontract amount, and estimated start and finish dates. Send this list to the Wage and Hour Section (contact information below).

Certified Payrolls must be submitted every two weeks. Before the second Friday, each CONTRACTOR and Subcontractor must file Certified Payrolls with Statements of Compliance for the previous two weeks. Indicate ***"Start"*** on your first payroll, and ***"Final"*** on your last payroll for this Project.

As part of the **final payment request package,** CONTRACTOR must submit a "NOTICE OF COMPLETION OF PUBLIC WORKS" form signed by ADOL personnel.

Contact Information:

Wage and Hour Section
State of Alaska
Department of Labor and Workforce Development
Labor Standards and Safety Division
Wage and Hour Administration
P.O. Box 11149
Juneau, AK 99811-1149
907-465-4842
http://labor.state.ak.us/lss/home.htm

and

Greg Smith, Contract Administrator
City and Borough of Juneau
155 S. Seward Street
Juneau, AK 99801
(907) 586-0873
Greg.Smith@juneau.org

END OF SECTION

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work under separate contracts.
4. Access to site.
5. Coordination with occupants.
6. Work restrictions.
7. Specification and drawing conventions.
8. Miscellaneous provisions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

2. Section 015221 “Special Safety Requirements - ICRA” for procedures that must be followed to maintain indoor air quality standards and contain any debris, dirt, dust, odors and/or other contaminants generated by the Contractor’s operations.

1.2 PROJECT INFORMATION

A. Project Identification: BRH – OR Ventilation System Upgrades CBJ Contract No: E16-095

1. Project Location: The site of the WORK is 3260 Hospital Drive, Juneau, Alaska 99801

B. Owner: City and Borough of Juneau, 155 South Seward Street, Juneau, Alaska 99801

1. Using Agency: Bartlett Regional Hospital

2. Using Agency Representative: Mark Walker, BRH Facilities Manager
e-mail: mwalker@bartletthospital.org
Work phone: 796-8888 Cell phone: 321-4333

C. Construction Administration: Wilson Engineering, 130 South Seward St., Juneau, Alaska 99801

1. Project Manager: Mike Greene mgreene@wileng.net Phone: 1-907-321-0057

D. Engineer of Record: Murray & Associates, P.O. Box 21081, Juneau, Alaska 99802-1081

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the installation of a 20 ton water cooled chiller and associated fittings, valves and piping, and the installation of a circulation pump, expansion tank, air/dirt separator and glycol fill tank within Mechanical Penthouse Z-2. Work will include the installation of low temperature chilled water supply and return piping and heat trace between Mechanical Penthouse Z-2 and Mechanical Penthouse Z-3, installation of low temperature chilled water supply and return piping system within Mechanical Penthouse Z-3, the replacement of duct humidifiers in Mechanical Penthouse Z-3, modifications to the existing building automation / controls system and modifications to the existing electrical distribution and heat trace systems.

B. The Work will include, but is not necessarily limited to, the installation of balancing dampers within the existing return air and supply air ductwork that is located above the existing painted gypsum board ceilings in Public Corridor 2211A and above the painted gypsum board ceilings in Corridor 2316B and Corridor 2316C within the occupied Operating Room area.

C. Type of Contract.

1. Project will be constructed under a single prime contract.

1.4 WORK UNDER SEPARATE CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.

1.5 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for parking, materials delivery, storage and staging, and for construction operations.

B. Use of Site: Limit use of Project site to the staging area located within the undeveloped (unpaved) portion of the large parking lot. Do not disturb portions of the Project site beyond areas in which the Work is indicated.

1. Driveways, Walkways and Entrances: Keep driveways, patient drop-off areas and entrances serving the premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weather tight condition throughout construction period. Immediately repair any damage caused by construction operations.

1.6 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: OWNER will occupy the Bartlett Regional Hospital and the Operating Areas during the entire construction period – 24 hours a day / 7 days a week. Coordinate all construction related operations with OWNER to minimize conflicts, facilitate Owner usage of the building, and so as to not interfere with OWNER'S day-to-day operations. OWNER reserves the right to stop work on short notice – whether construction related or not.

1. Maintain access to existing exits, walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from OWNER and approval of authorities having jurisdiction.
2. Maintain access to NO LESS than TWO of the three Operating Room Suites at any given time.
3. Notify User Agency Representative not less than 72 hours in advance of activities that will affect Owner's operations.
4. OWNER will prepare a Certificate of Substantial Completion for the Work prior to Owner acceptance of the completed Work

1.7 WORK RESTRICTIONS

A. Work Restrictions: The CONTRATOR MUST comply with the following restrictions associated with working within occupied portions of the hospital;

1. The Contractor must comply with the Safety/guidelines and policies established by the Department of Infection Control/Safety/Facilities of Bartlett Regional Hospital covering Infection Control for Construction and Renovation. (See BRH Policy at the end of Section 015221 – Special Safety Requirements - ICRA.)

2. The Contractor MUST NOT stage materials within Corridor 2211A or within Corridor 2316B / 2316C. Only the materials that are to be immediately installed are to be brought into these interior corridors. All materials and debris are to be removed from these corridors at the end of each work day.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 8:00 a.m. to 5:00 p.m., Monday through Friday, unless otherwise indicated or coordinated with the Owner.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Marc Walker, BRH Facilities Manager not less than two days in advance of proposed utility interruptions.
2. Obtain Marc Walker, BRH Facilities Manager written permission before proceeding with utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

1. Notify Marc Walker, BRH Facilities Manager not less than two days in advance of proposed disruptive operations.
2. Obtain Marc Walker, BRH Facilities Manager written permission before proceeding with disruptive operations.

E. Nonsmoking Building: Smoking is not permitted within the building or anywhere on the Bartlett Regional Hospital campus.

F. Controlled Substances: Use of tobacco products and other controlled substances within the Bartlett Regional Hospital building or campus is not permitted.

G. The use of portable radios / stereos is not permitted in the building or on the BRH campus.

1.8 MISCELLANEOUS PROVISIONS

A. Every member of the Contractor's work force that will be coming onto the Bartlett Hospital campus must receive Hospital orientation training from the Facilities Director prior to beginning work. Coordinate with Marc Walker, BRH Facilities Manager to set up a training schedule. Training duration is estimated to be no more than 10 – 15 minutes.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 011025 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SCOPE

A. Payment for the various items of the Bid Schedule, as further specified herein, shall include all compensation to be received by the CONTRACTOR for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of WORK being described, as necessary to complete the various items of the WORK all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, and including all costs of permits and cost of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA).

B. No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs therefor shall be included in the prices named in the Bid Schedule for the various appurtenant items of WORK.

C. In addition to other incidental items of WORK listed elsewhere in the contract, the following items shall also be considered as incidental to other Items of WORK under this contract:

1. Maintenance of all services (power, water, communication, data, security) through Project area.

1.2 PRICE BASED ON LUMP SUM PAY UNIT

A. Measurement for payment for the Lump Sum Pay Unit will be based upon the completion of the entire WORK as a Lump Sum Pay Unit, complete, all in accordance with the requirements of the Contract Documents.

B. Payment will be made at the amount shown on the Bid Schedule, which payment will constitute full compensation for all WORK.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 012500 – SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

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

1.3 GENERAL SUBMITTAL REQUIREMENTS

A. Provide name of Owner (CBJ/BRH) and CBJ project number on all substitution requests and other written communication.

1.4 ACTION SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include name of Owner, CBJ project number, Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use CSI Form 13.1A or similar approved form.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

    a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
    c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    e. Samples, where applicable or requested.
    f. Certificates and qualification data, where applicable or requested.

g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Owner/Project Manager's Action: If necessary, Owner/Project Manager will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Owner/Project Manager will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Owner/Project Manager's Supplemental Instructions for minor changes in the Work.
b. Use product specified if Owner/Project Manager does not issue a decision on use of a proposed substitution within time allocated.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

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

1. Conditions: Owner/Project Manager will consider Contractor's request for substitution when the following conditions are satisfied:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Requested substitution will not adversely affect Contractor's construction schedule.
c. Requested substitution has received necessary approvals of authorities having jurisdiction.
d. Requested substitution is compatible with other portions of the Work.

e. Requested substitution has been coordinated with other portions of the Work.
f. Requested substitution provides specified warranty.
g. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Owner/Project Manager will consider requests for substitution if received within 14 days after the Notice to Proceed.

1. Conditions: Owner/Project Manager will consider Contractor's request for substitution when the following conditions are satisfied:

a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
b. Requested substitution does not require extensive revisions to the Contract Documents.
c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
d. Requested substitution will not adversely affect Contractor's construction schedule.
e. Requested substitution has received necessary approvals of authorities having jurisdiction.
f. Requested substitution is compatible with other portions of the Work.
g. Requested substitution has been coordinated with other portions of the Work.
h. Requested substitution provides specified warranty.
i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 – CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.2 MINOR CHANGES IN THE WORK

A. Owner/Project Manager will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.3 GENERAL SUBMITTAL REQUIREMENTS

A. Provide name of Owner (CBJ/BRH) and CBJ project number on all proposal requests and other written communication.

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Owner/Project Manager will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Work Change Proposal Requests issued by Owner/Project Manager are not instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include costs of labor and supervision directly attributable to the change.
    d. Include a statement that indicates the effect of the change on the construction schedule, including, start and finish times. Use available total float before requesting an extension of the Contract Time.
    e. Quotation Form: Use forms acceptable to Owner/Project Manager.

B. Contractor-Initiated Work Change Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Owner/Project Manager.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include a statement that indicates the effect of the change on the construction schedule, including, start and finish times. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Work Change Proposal Request Form: Use form acceptable to Owner/Project Manager.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Changes Proposal Request, Owner/Project Manager will issue a Change Order for signatures of Owner and Contractor on CBJ standard change order form.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 – PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Requirements:

1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
2. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.2 GENERAL SUBMITTAL REQUIREMENTS

A. Provide name of Owner (CBJ/BRH) and CBJ project number on all payment requests and other written communication.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Coordinate line items in the schedule of values with other required administrative forms and schedules.
2. Submit the schedule of values to Owner/Project Manager at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:

a. Project name and location.
b. Name of Owner.
c. CBJ project number.
d. Name of Engineer.
e. Contractor's name and address.
f. Date of submittal.

2. Arrange schedule of values consistent with format of AIA Document G703.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents.

4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

6. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Owner/Project Manager and paid for by Owner.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Times: Submit Application for Payment to Owner/Project Manager by the 10th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.

D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

E. Application Preparation: Complete every entry on form. Execute by a person authorized to sign legal documents on behalf of Contractor. Owner/Project Manager will return incomplete applications without action.

1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

F. Transmittal: Submit electronic pdf of signed original copy of each Application for Payment to Owner/Project Manager by a method ensuring receipt within 24 hours or by electronic submittal via email in PDF format. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.

2. When an application shows completion of an item, submit conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. Schedule of values.
2. Contractor's construction schedule (preliminary if not final).
3. Submittal schedule (preliminary if not final).
4. List of Contractor's staff assignments.
5. List of Contractor's principal consultants.
6. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
7. Report of preconstruction conference.

I. Application for Payment at Substantial Completion: After Owner/Project Manager issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Updated final statement, accounting for final changes to the Contract Sum.
3. AIA Document G706-1994, "Contractor's Affidavit of Payment of Debts and Claims."
4. AIA Document G706A-1994, "Contractor's Affidavit of Release of Liens."
5. AIA Document G707-1994, "Consent of Surety to Final Payment."
6. Evidence that claims have been settled.
7. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 – PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. Requests for Information (RFIs) & Design Clarifications (DCs).
   2. Project meetings.

B. Related Requirements:

   1. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 DEFINITIONS

A. REQUEST FOR INFORMATION (RFI) - Request from Contractor seeking information about or interpretation of the Contract Documents.

B. DESIGN CLARIFICATION (DC) - Document issued by Design team providing clarification of design intent or interpretation of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

   1. Name, address, and telephone number of entity performing subcontract or supplying products.
   2. Number and title of related Specification Section(s) covered by subcontract.
   3. Drawing number and detail references, as appropriate, covered by subcontract.

1.4 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work.

B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

   1. Preparation of Contractor's construction schedule.
   2. Preparation of the schedule of values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of submittals.

5. Progress meetings.
6. Pre-installation conferences.
7. Project closeout activities.

1.5 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Owner/Project Manager will return RFIs submitted to Owner/Project Manager by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. CBJ Project number.
3. Date.
4. Name of Owner.
5. Name of Contractor.
6. Name of Project Manager
7. Name of Engineer(s).
8. RFI number, numbered sequentially.
9. RFI subject.
10. Specification Section number and title and related paragraphs, as appropriate.
11. Drawing number and detail references, as appropriate.
12. Field dimensions and conditions, as appropriate.
13. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
14. Contractor's signature.
15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

C. RFI Forms: AIA Document G716 or a Software-generated form with substantially the same content as indicated above, acceptable to Owner/Project Manager.

D. Owner/Project Manager’s Action: Owner/Project Manager will review each RFI, determine action required, and respond. Allow seven working days for Owner/Project Manager’s response for each RFI. RFIs received by Owner/Project Manager after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:

a. Requests for approval of submittals.
b. Requests for approval of substitutions.
c. Requests for coordination information already indicated in the Contract Documents.

d. Requests for adjustments in the Contract Time or the Contract Sum.
e. Requests for interpretation of Owner/Project Manager's actions on submittals.
f. Incomplete RFIs or inaccurately prepared RFIs.

2. Owner/Project Manager's action may include a request for additional information, in which case Owner/Project Manager's time for response will date from time of receipt of additional information.
3. Owner/Project Manager's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Owner/Project Manager in writing within 10 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly. Include the following:

1. CBJ Project name.
2. Name and address of Contractor.
3. Name and address of Engineer(s).
4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Owner/Project Manager's response was received.

F. On receipt of Owner/Project Manager's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Owner/Project Manager within seven days if Contractor disagrees with response.

1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.6 DESIGN CLARIFICATIONS (DCs)

A. On receipt of Design Clarification immediately distribute the DC to affected parties.
1. Owner/Project Manager's action on DCs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

a. If Contractor believes the DC warrants change in the Contract Time or the Contract Sum, notify Owner/Project Manager in writing within 7 days of receipt of the DC.

1.7 PROJECT MEETINGS

A. General: Contractor is to schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner/Project Manager and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within three days of the meeting.

B. Preconstruction Conference: Owner/Project Manager will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner/Project Manager and Architect, but no later than 10 days after execution of the Agreement.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Tentative construction schedule.
    b. Critical work sequencing and long-lead items.
    c. Designation of key personnel and their duties.
    d. Procedures for processing field decisions and Change Orders.
    e. Procedures for RFIs & DC’s.
    f. Procedures for processing Applications for Payment.
    g. Distribution of the Contract Documents.
    h. Submittal procedures.
    i. Preparation of record documents.
    j. Use of the premises.
    k. Work restrictions.
    l. Working hours.
    m. Owner's occupancy requirements.
    n. Responsibility for temporary facilities and controls.
    o. Construction waste management and recycling.
    p. Parking availability.
    q. Office, work, and storage areas.
    r. Equipment deliveries and priorities.
    s. First aid.
    t. Security.
    u. Progress cleaning.

3. Minutes: Owner/Project Manager is responsible for conducting meeting & will record and distribute meeting minutes.

C. Progress Meetings: Contractor to conduct progress meetings at weekly intervals.

1. Attendees: In addition to representatives of Owner/Project Manager and Architect, each contractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

    b. Review present and future needs of each entity present, including the following:
        1) Sequence of operations.
        2) Status of submittals.
        3) Deliveries.
        4) Off-site fabrication.
        5) Access.
        6) Progress cleaning.
        7) Quality and work standards.
        8) Status of correction of deficient items.
        9) Field observations.
        10) Status of RFIs and DCs.
        11) Status of proposal requests.
        12) Pending changes.
        13) Status of Change Orders.
        14) Pending claims and disputes.

3. Minutes: Contractor is responsible for conducting the meeting and will record and distribute the meeting minutes to each party present and to parties requiring information.

    a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's construction schedule.
2. Construction schedule updating reports.
3. Weekly construction reports
4. Site condition reports.

1.2 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

C. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

1.3 GENERAL SUBMITTAL REQUIREMENTS

A. Provide name of Owner (CBJ /BRH) and CBJ project number on all submittals and other written communication.

1.4 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. Working electronic copy of schedule file, where indicated.
2. PDF electronic file.

B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.

C. Construction Schedule Updating Reports: Submit with Applications for Payment.

D. Weekly Construction Reports: Submit at weekly intervals.

E. Site Condition Reports: Submit at time of discovery of differing conditions.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of final completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 10 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for long lead items and major items, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
5. Punch List and Final Completion: Include not more than 14 days for completion of punch list items and final completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Work Restrictions: Show the effect of the following items on the schedule:

a. Coordination with existing construction.
b. Limitations of continued occupancies.
c. Uninterruptible services.
d. Partial occupancy before Substantial Completion.
e. Use of premises restrictions.
f. Provisions for future construction.
g. Environmental control.

D. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 15 days of date established for commencement of the Work.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

2.3 REPORTS

A. Weekly Construction Reports: Prepare a construction report recording the following information concerning events at Project site:
1. Approximate count of personnel at Project site.
2. Equipment at Project site.
3. Material deliveries.
4. High and low temperatures and general weather conditions, including presence of rain or snow.
5. Accidents.
6. Meetings and significant decisions.
7. Unusual events.
8. Stoppages, delays, shortages, and losses.
9. Meter readings and similar recordings.
10. Emergency procedures.
11. Orders and requests of authorities having jurisdiction.
12. Change Orders received and implemented.
13. Construction Change Directives received and implemented.
14. Services connected and disconnected.
15. Substantial Completions authorized.

B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate final completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Project Manager Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 013300 – SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Requirements:
   1. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
   2. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
   3. Section 230510 “General Mechanical HVAC” for submittal requirements.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action.

B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.3 GENERAL SUBMITTAL REQUIREMENTS

A. Provide name of Owner (CBJ/BRH) and CBJ project number on all submittal documents, transmittals or other written communication.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Engineer's Digital Data Files: Electronic copies of digital data files of the Contract Drawings will be provided by Engineer for Contractor's use in preparing submittals.

   1. Engineer will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.

      a. Engineer makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
      b. Digital Drawing Software Program: The Contract Drawings are available in AutoCAD.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

   1. Coordinate each submittal with fabrication, purchasing, delivery, other submittals, and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 10 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 10 days for review of each resubmittal.

D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.

    a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., CBJ E16-095-061000.01). The sequential number shall increase for each added submittal/resubmittal (e.g., CBJ E16-095-061000.02).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Engineer.
4. Transmittal Form for Electronic Submittals: Use from containing the following information:

    a. Project name. Include Owner name (CBJ/BRH)
    b. Date.
    c. Name and address of Engineer(s).
    d. Name of Project Manager.
    e. Name of Contractor.
    f. Name of firm or entity that prepared submittal.
    g. Names of subcontractor, manufacturer, and supplier.
    h. Category and type of submittal.
    i. Submittal purpose and description.
    j. Specification Section number and title.
    k. Specification paragraph number or drawing designation and generic name for each of multiple items.
    l. Drawing number and detail references, as appropriate.
    m. Location(s) where product is to be installed, as appropriate.
    n. Related physical samples submitted directly.
    o. Transmittal number.
    p. Remarks.

E. Options: Identify options requiring selection by Engineer / Owner.

F. Deviations: Identify deviations from the Contract Documents on submittals.

G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements:

1. Submit electronic submittals via email as PDF electronic files.

a. Engineer will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's catalog cuts.
b. Manufacturer's product specifications.
c. Standard color charts.
d. Statement of compliance with specified referenced standards.
e. Testing by recognized testing agency.
f. Application of testing agency labels and seals.
g. Notation of coordination requirements.

4. Submit Product Data before or concurrent with Samples.
5. Submit Product Data in the following format:

a. PDF electronic file.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

    a. Identification of products.
    b. Schedules.
    c. Notation of coordination requirements.
    d. Notation of dimensions established by field measurement.
    e. Relationship and attachment to adjoining construction clearly indicated.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 11 inches x17 inches.
3. Submit Shop Drawings in the following format:

    a. PDF electronic file.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Identification: Attach label on unexposed side of Samples that includes the following:

    a. Generic description of Sample.
    b. Product name and name of manufacturer.
    c. Sample source.
    d. Number and title of applicable Specification Section.

2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

    a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Owner / Project Manager will return submittal with options selected.

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

1. Submit product schedule in the following format:

    a. PDF electronic file.

F. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."

G. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures.

H. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."

I. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."

J. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer / Owner.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION

A. General: Engineer / Owner will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

C. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 013300

SECTION 014200 – REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

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

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

1. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
2. ICC - International Code Council; www.iccsafe.org.
3. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

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

B. Related Requirements:

1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.
2. Section 015221 – Special Safety Requirements (ICRA)

1.2 USE CHARGES

A. Water and Electrical Power from Existing System: Water and Power from Owner's existing water and power systems are available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

PART 2 - PRODUCTS – Not Used

PART 3 - EXECUTION

A. Sanitary Facilities: Use of Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

B. Parking: Contractor personnel are to park within the gravel portion of the general parking lot located adjacent to the Juneau Medical Center building.

C. Materials Staging: Materials can be staged within the gravel portion of the general parking lot, as well as in Mechanical Penthouse Z2 and Mechanical Penthouse Z3. Materials are generally not to be staged on the roof. Materials temporarily placed on the roof must not be allowed to be in direct contact with the EPDM roofing membrane. Place materials on plywood sheets or other approved separation material. Storage within the building is to be limited to materials and tools planning to be used that shift.

D. All trash and debris is to be removed from the project site at the end of every work shift.

E. Existing Elevator Use: Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner.

1. Do not load elevators beyond their rated weight capacity.

F. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner.

3.2 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, finishes, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

END OF SECTION 015000

SECTION 015220 – SECURITY

PART 1 – GENERAL

1.1 SECURITY PROGRAM

A. The CONTRACTOR shall:

1. Protect WORK, existing premises, and Using Agency's operations from theft, vandalism, unauthorized entry, and unauthorized exiting from secure areas.
2. Initiate security efforts in coordination with Using Agency's existing security program at initialization of Project mobilization.
3. Maintain security efforts throughout construction period until Final Completion.

1.2 ENTRY AND EXIT CONTROL

A. The CONTRACTOR shall NOT:

1. Facilitate the entry of non-construction personnel into materials staging areas, mechanical rooms, mechanical penthouses, rooftops or other non-public areas.

1.3 PERSONNEL IDENTIFICATION

A. At the discretion of the OWNER, the CONTRACTOR shall:

1. Require each person authorized to enter premises to possess and visibly display an identification card.
2. Require return of cards from all individuals when they are no longer involved with WORK at the Project site.

B. Identification cards shall be provided by the Using Agency and will include personal photograph; name, title and employer, and assigned number. Identification cards will be issued only after each individual has completed a special training program administered by Bartlett Regional Hospital. The program is anticipated to take less than one hour, but is mandatory.

1.4 RESTRICTIONS

A. All personnel employed on the Project site by the CONTRACTOR, Subcontractors, Suppliers, installers and other entities engaged in WORK shall strictly adhere to the security, safety, confidentiality, and hospital compliance program requirements depicted in Section 015221 – Special Safety Requirements (ICRA).

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 015220

SECTION 015221 – SPECIAL SAFETY REQUIREMENTS

PART 1 – GENERAL

1.1 SAFETY PROGRAM

A. General:

1. The safety of bidders, the CONTRACTOR, their work forces in total, the USING AGENCY's personnel, patients and the public is a major concern of the OWNER and the PROJECT MANAGER. To ensure Project and campus wide safety, the CONTRACTOR shall carefully adhere to the requirements outlined within this section and within any attached BRH policies.
2. CONTRACTOR shall employ a safety program to insure that CONTRACTOR's personnel and all personnel of the Subcontractors, Suppliers, Installers and material workers are trained and kept abreast of hospital safety requirements. In addition to the safety requirements enforced by code or jurisdictional entities, the CONTRACTOR's safety program shall also address fire safety and deployment plans for the Project site, response to accidental release of hazardous materials, breach of infection containment barriers, and general emergency response.
3. CONTRACTOR's safety program will be provided to the PROJECT MANAGER, in writing, prior to commencement of WORK. Plans shall be periodically revised in response to issues that may arise during the course of the WORK. Such revisions shall be provided promptly to the PROJECT MANAGER.

B. The CONTRACTOR shall;
1. Abide by all applicable safety practices and requirements, irrespective of their origins.
2. Attend safety related meetings as may be required by the OWNER or PROJECT MANAGER.
3. CONTRACTOR shall employ a safety program to insure that CONTRACTOR's personnel and all personnel of the Subcontractors, Suppliers, Installers and material workers are trained and kept abreast of hospital safety requirements. Maintain program throughout construction period until Final Completion.

1.2 SAFETY STANDARDS

A. Applicable safety related standards promulgated by safety or code enforcement agencies, such as but not limited to; AK-DEC, OSHA, Building Officials and Fire Marshal's Office representatives.

B. Safety/guidelines and policies established by the Department of Infection Control/Safety/Facilities of Bartlett Regional Hospital covering Infection Control for Construction and Renovation. (See BRH Policy at the end of this section.)

C. Safety guidelines and policies established by Bartlett Regional Hospital covering Interim Life Safety Plan. (See BRH Policy at the end of this section.)

D. Safety Requirements required by the Contract Documents.

1.3 SAFETY PROCEDURES

A. In addition to devices required by safety or code enforcement agencies, the CONTRACTOR shall employ safety and containment devices (barricades, temporary separation/isolation walls, temporary directional signage, warning signs, etc.) at all locations where the public, patients or hospital staff may have access to, or mistakenly venture into, an area of active construction or an area where material / equipment items may be stored or staged. The PROJECT MANAGER will have the final determination as to the locations and the extent of the required safety containment devices and temporary directional / warning signage.

B. As determined by the PROJECT MANAGER, and where conditions necessitates the construction of temporary exit routes or temporary exit detours, the CONTRACTOR shall develop and/or construct such routes to the standards of the Contract Documents, or the enforcement agency. The CONTRACTOR shall provide and post temporary directional and warning signs at all temporary exit routes. Such routes and all temporary signage shall be approved by the PROJECT MANAGER prior to putting them into use.

C. Any temporary safety / containment devices erected within the OR CORRIDORS must be removed at the end of each work day. All associated temporary directional and/or safety signage must also be removed at the end of each work day.

D. Any temporary exit detours used within the OR CORRIDORS, must be removed, and the use of the original exit routes restored, at the end of each work day. All associated temporary directional and/or safety signage must also be removed at the end of each work day.

E. Temporary signage shall consist of pre-printed 8-1/2x11 inch standard paper stock attached to walls or doors with removable painters tape. No tacks, pins or staples are to be used in conjunction with any temporary signage.

F. CONTRACTOR shall not remove, block or otherwise obscure any of the existing permanent directional signage without specific written direction by the PROJECT MANAGER. CONTRACTOR shall cooperate with and assist the USING AGENCY in the establishment and maintenance of temporary “user oriented” direction signage.

G. Permanent directional signage that has been disrupted or damaged during the course of construction shall be immediately repaired or replaced by the CONTRACTOR.

1.4 SECURITY SERVICE

A. The CONTRACTOR shall;
   1. Provide all security personnel and programs as described in Specification Section 015220 – Security.
   2. Cooperate with the USING AGENCY, the security forces employed by the USING AGENCY and the PROJECT MANAGER to insure the security and safety of the Project, the public, patients and BRH staff, and all other facilities on the hospital campus.
   3. The CONTRACTOR is forewarned that the USER AGENCY may observe all construction operations and safety practices via audio and video means.

1.5 RESTRICTIONS WITHIN ACTIVE CONSTRUCTION AREAS

A. All personnel employed on the Project site by the CONTRACTOR, Subcontractors, Suppliers, installers and other entities engaged in WORK shall strictly adhere to the security, safety, confidentiality, and hospital compliance program requirements depicted within this section.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 015221

Bartlett Regional Hospital

Title: **ICRA: INFECTION CONTROL FOR CONSTRUCTION AND RENOVATION**

Department: Infection Control/Safety/Facilities

Original Date: 07-02 Author: Infection Control

PURPOSE:

To establish a process for the identification and reduction of risk from airborne transmission of infectious agents during construction, demolition, renovation, and repair on the Bartlett Regional Hospital Campus.

DEFINITIONS:

A. **ICRA:** Infection Control Risk Assessment. Analysis of a construction, demolition, or renovation project to establish infection risk and control by a multidisciplinary group designated for that purpose.

B. **Infection Control Permit:** A permit issued by Infection Control for construction and renovation projects that are Class III or above as determined by the Infection Control Risk Group Matrix. (in the Infection Control Risk Assessment Packet, Appendix C)

C. **ICRAC:** Infection Control Risk Assessment Committee. An ad hoc subcommittee of the BRH Infection Control Committee tasked with development, oversight, and enforcement of this policy.

D. **HEPA Filter:** High efficiency particulate air filters. (99% of 0.3-micron size particles)

E. **HVAC:** Heating, Ventilation, Air-conditioning. (Air-handling unit.)

F. **CRP:** Construction and Renovation Policy. (This policy.)

POLICY:

A. An Infection Control Risk Assessment (ICRA) will be performed for every construction, demolition, and renovation project on the BRH campus, including site work (utilities, landscaping, etc) even when no building is being constructed or renovated.

B. Bartlett Regional Hospital requires any subcontractor, sub-subcontractor, vendor, employee, or agent to be bound by these requirements. Before any demolition or construction on-site begins, the contractor and contractor's employees will attend mandatory training sessions provided by a Bartlett Regional Hospital Safety or Infection Control representative. Course objectives will be distributed at class.

C. An Infection Control Permit (see the Infection Control Risk Assessment Packet Appendix C) will be issued by the ICRAC and posted at the work-site as appropriate for the duration of the project, as indicated by the ICRA.

D. Changes to the ICRA may be made by the ICRAC at any time during the project. Changes will be communicated to the Construction Manager or designee.

E. Bartlett Regional Hospital's Safety Officer or the ICRAC may modify performance requirements for certain activities. A modification made by BRH personnel does not relieve the contractor of compliance with proper infection control procedures.

F. When required by the Infection Control Permit, HEPA equipped filtration machines shall provide air flow into construction area not less than 100 FPM at barricade entrances with doors fully open. HEPA equipped air filtration machines shall be connected to normal power and ganged to a single switch for emergency shutoff and shall run continuously. In the event of a power failure and no back-up power is immediately available, work will be stopped until power becomes available.

G. Documentation of the ICRA process will be maintained by the Construction Manager or designee.

H. Regular reports will be provided to the Infection Control Committee by a representative of the ICRAC.

PROCEDURES:

A. Responsibilities During Project Planning

A.1. An interdisciplinary team including architects, construction managers, contractors, department personnel, the Infection Control Coordinator, and Safety Officer will evaluate any construction project from design through completion for infection control concerns.

A.2. The Infection Control Coordinator will be involved in the design phase of any project. The design and function considerations for infection control are listed in Appendix A. These considerations are for the duration of the project, as well as considerations for the infection control issues for the finished project. The Construction Manager or designee will contact the Infection Control Coordinator for obtaining input on the project.

A.3. Each project will have an Infection Control Risk Assessment (ICRA) performed during the planning phase of the project. Projects in Class III, III/IV, or IV require an Infection Control Permit to be posted at the site for the duration of the project. (Appendix C)

A.4. Construction measures required by the ICRA will be communicated to the contractors by the Construction Manager or designee during the bidding phase of the project. All contractors and contract construction personnel be responsible for maintaining and complying with the general and class specific infection control and safety practices for the project.

B. **Responsibilities During the Active Construction Phase**

B.1. The Construction Manager or designee will perform a Safety and Infection Control Risk Assessment for every day that there is work on the site (Appendix B). Unsafe conditions will be corrected immediately and corrections documented on the form. The Construction Manager or designee is responsible for oversight and documentation of this process.

B.2. As a quality control measure, a member of the ICRAC will review monitoring reports compiled by the Project Manager for each project of Class III or greater. The ICRAC will receive updates via written reports, emails, or meetings as circumstances warrant. The Construction Manager or designee will be notified immediately to correct any unsafe conditions.

B.3. The contractor shall be required to take immediate action to correct all deficiencies.

B.4. The ICRAC has the authority to stop construction for any breach in the infection control practices, or for any patient safety concern related to infection and construction. This will be done through the Construction Manager or designee.

B.5. Failure of the contractor to promptly correct such deficiencies will result in corrective action taken by CBJ and BRH Construction Management per project documents.

B.6. The Contractor will notify the Construction Manager or designee for any assistance with medical waste, work in negative pressure areas, or any concerns involving patients or patient care areas.

C. General Infection Control Practices for All Construction and Renovation Projects

C.1**.** Construction activities causing disturbance of existing dust, or creating new dust, must be conducted in tight enclosures cutting off any flow of particles into patient areas.

C.2. Construction areas will have dust mops, wet mops, brooms, buckets, and clean rags for wiping fine dust from floors and surfaces in adjacent areas.

C.3. Walk-off mats shall be used outside of every construction entrance. Any dust outside the barrier shall be cleaned up immediately using a HEPA-filtered vacuum or wet mop.

C.4. Debris from the construction site will be removed with carts that are covered in a manner that does not allow the escape of dust.

C.5. Any ceiling tiles that are moved (even for visualization) outside of the construction barrier will be replaced immediately when unattended.

C.6. Barriers

C.6.1. Closed door with masking tape applied over the frame and door is acceptable for projects that can be contained within a single room.

C.6.2. Construction, demolition or reconstruction not capable of containment within a single room must have the following barriers erected:

C.6.2.1. Small, short duration projects generating minimal dust may use fire-rated plastic sheeting that extends from floor to ceiling. Seams must be sealed with tape to prevent dust and debris from escaping and have at least 2-foot overlapping flaps for access to entry.

C.6.2.2. Any project generating moderate to high levels of dust or of more than short duration must require rigid dust-proof, and fire-rated barrier walls (e.g. drywall) with caulked seams. An interim plastic dust barrier may be required to protect the area while the rigid impervious barrier is being constructed.

C.6.2.3. Barriers are required at penetrations of ceiling envelopes, chases and ceiling spaces to stop movement of air and debris.

C.6.2.4. Large dusty projects require an anteroom or double entrance vestibule for workers to remove protective clothing or vacuum off existing clothing.

C.7. HEPA-filtered negative pressure units will be run continually during the course of the project (24 hours per day).

D. **Performing An Infection Control Risk Assessment**

D.1. Each project will have an Infection Control Risk Assessment done during the programming phase of the project. The results will be communicated with the architect and contractor. (See ICRA Packet, Appendix C).

D.2. Class III and higher projects require an Infection Control Permit before construction begins. (ICRA Packet, Appendix C)

REFERENCES:

Bartley, J., ed. (1999). APIC Infection Control Toolkit Series: Construction and Renovation. Washington, DC: Association for Professionals in Infection Control and Epidemiology, Inc.

Centers for Disease Control and Prevention, Healthcare Infection Control Practices Advisory Committee. (2001). Draft Guideline for Environmental Infection Control in Healthcare Facilities.

Comprehensive Manual on Accreditation of Hospitals (2001). Oakbrook, IL.: Joint Commission on Accreditation of Hospitals and Healthcare Organizations: 2001.

Davis, S. (2001). "Don't Wait for Dust to Settle on Patient Risk." In Environment of Care Leader (6) 11. (May 21, 2001).

Approval/Review/Revision					
Date:	Signature:	Date:	Signature:	Date:	Signature:
11/1/02	Dr. Hunter-Joerns				
8/3/04	Dr. Hunter-Joerns				
2/07/06	Dr. Hunter-Joerns				
2/21/08	Dr. Hunter-Joerns				
8/2/11	Dr. Hunter-Joerns				

APPENDIX A:
Construction Design and Function Considerations for Environmental Infection Control

A. Location of sinks and handwashing product dispensers.

B. Types of faucets (aerated vs. non-aerated, and type of faucet e.g. wrist blades, knee, foot, or infrared controlled).

C. Air-handling systems engineered for optimal performance and easy maintenance and repair.

D. Air changes per hour (ACH) and pressure differentials to accommodate special patient care areas.

E. Location of fixed sharps containers.

F. Types of surface finishes (non-porous vs. porous).

G. Well-caulked wall with minimal seams.

H. Location of adequate storage and supply areas.

I. Appropriate location of medicine preparation areas (e.g. >3ft. from a sink).

J. Appropriate location and type of ice machines.

K. Appropriate materials for sinks and wall coverings.

L. Appropriate traffic flow (no “dirty” movement through “clean” areas).

M. Isolation rooms with anterooms as required.

N. Appropriate flooring (e.g. seamless floors in dialysis units).

O. Sensible use of carpeting (e.g. no carpeting in special care areas or areas likely to become wet.)

P. Properly engineered areas for linen services and solid waste management.

Q. Location of main generator to minimize risk of system failure from flooding or other emergency.

R. Installation guidelines for gypsum wallboard.

From: Centers for Disease Control (2001) Guidelines for Environmental Infection Control in Healthcare Facilities (draft).

APPENDIX B:

Safety and Infection Control Risk Assessment Tool

Project No._____Date_____Time_____

DAILY INFECTION CONTROL MONITOR:

Standard	Yes	No	Corrected? / Comments
A. Construction Barricades:			
Barricades sealed, no penetrations			
Walk-off mats at all exits			
Barricade doors have closers			
Door frames gasketed, close and seal properly			
Adjacent ceiling areas intact			
Adjacent floors clean, no dust tracked			
B. Negative Air:			
Negative pressure at barricade entrance			
All windows and doors closed behind barricade			
Negative air machines running, filters clean, discharge hoses intact			
Demonstrated use of appropriate equipment to prevent airborne particulate matter: this includes HEPA filtration units, HEPA vacuum equipment, and continuous use of exhaust fans			
No construction activity within 25 feet of existing fresh air intake			
C. Jobsite:			
Project area clean, debris removed daily			
Debris removed in suitable closed containers			
No signs of pests			
No signs of water leakage			
D. Occupied Areas:			
Work authorized and scheduled			
Sheet plastic barricade in place and properly sealed			
Surrounding area clean			
Patient care equipment and supplies removed from construction area			
Ceiling tiles replaced when not being accessed (if occupied area, adjacent patient doors are closed)			

DAILY SAFETY MONITOR:

Standard	Yes	No	Corrected? / Comments
A. General Safety:			
Contract workers wearing required identification			
Construction personnel wearing required PPE (e.g. hardhat, goggles, coveralls, etc.)			
Construction area secure (e.g. barriers adequate to prevent entry of unauthorized persons)			
Construction personnel following safe work practices (e.g. ladder safety, no smoking, trip and fall hazards, etc.)			
Power secured at end of each day			
Extension cords grounded, in good condition			
B. Exits			
Exits provide free and unobstructed access			
Alternate egress established and workers received training			
Negative air machines running, filters clean, discharge hoses intact			
C. Fire Equipment:			
Fire alarms, detection, and suppression systems operational			
Additional fire equipment and training provided for personnel			
D. Fire Safety:			
No smoking policy implemented			
Minimum of two fire drills per shift per quarter			
Area free of storage, housekeeping materials, food waste, and debris to reduce flammable and combustible fire load of building			

Additional comments and observations: _____

_____

_____

Inspector Signature: _____

APPENDIX C

INFECTION CONTROL RISK ASSESSMENT PACKET

An Infection Control Risk Assessment (ICRA) will be performed by the Construction Manager or designee for every construction, demolition, and renovation project on the Bartlett Regional Hospital campus, including site work (utilities, landscaping, etc.) even when no building is being constructed or renovated.

1. Step #1: Using the following table, determine the <u>type</u> of construction activity and *<u>circle</u>* Type A, B, C, or D.:

The construction activity types are defined by the amount of dust generated, the duration of the activity, and the amount of shared HVAC systems.
Contact Infection Control if any activity is questionable under these guidelines.

Circle one **Type** below:

Type A	**Inspection and Non-Invasive Activities** Includes, but is not limited to: ☐ removal of ceiling tiles for visual inspection limited to 1 tile per 50 square feet ☐ painting (but not sanding) ☐ wall covering, electrical trim work, minor plumbing, and activities which do not generate dust or require cutting of walls or access to ceilings other than for visual inspection
Type B	**Small Scale, Short Duration Activities Which Create Minimal Dust** Includes, but is not limited to: ☐ installation of telephone and computer cabling ☐ access to chase spaces ☐ cutting of walls or ceiling where dust migration can be controlled
Type C	**Work That Generates a Moderate to High Level of Dust or Requires Demolition or Removal of Any Fixed Building Components or Assemblies** Includes, but is not limited to: • sanding of walls for painting or wall covering ☐ removal of floor coverings, ceiling tiles and casework ☐ new wall construction ☐ minor duct work or electrical work above ceilings ☐ major cabling activities ☐ any activity which cannot be completed within a single workshif
Type D	**Major Demolition and Construction Projects** Includes, but is not limited to: ☐ activities that require consecutive work shifts ☐ requires heavy demolition or removal of a complete cabling system ☐ new construction

2. Step # 2.: Using the following table, identify the Infection Control Risk Group or Groups that will be affected by the construction activity, and *circle* Group 1, 2, 3, or 4.

*Circle the appropriate **Risk Group(s)** below:

Group 1 **Low Risk**	**Group 2** **Medium Risk**	**Group 3** **High Risk**	**Group 4** **Highest Risk**
☐ Office Areas ☐ Public Areas (except when associated with a higher risk area) ☐ All other nonpatient work areas (e.g. facilities, stores) ☐ Behavioral Health Units	☐ Cafeteria ☐ Patient care areas, inpatient and outpatient, except as noted in Groups 3 and 4.	☐ Emergency Department ☐ Radiology ☐ PACU ☐ Same Day Surgery ☐ Laboratory ☐ Kitchen ☐ Obstetrics ☐ Newborn Nursery ☐ Pharmacy ☐ PT: Tub and Treatment Rooms	☐ Critical Care Unit ☐ Special Care Nursery ☐ Operating Rooms, including C-Section Rooms ☐ Central Sterile Supply ☐ Endoscopy ☐ Infusion Therapy ☐ Pharmacy Admixture ☐ Negative Pressure Isolation Rooms

3. Step # 3: Determine the Level of Infection Control Activity required by *matching* the Construction **Type** with the Risk **Level** using the matrix below.

Circle one **Class** below**:**

	Construction Activity-Infection Control Matrix			
	Construction Activity			
Risk Level	**Type A**	**Type B**	**Type C**	**Type D**
Group 1	I	II	II	III/IV
Group 2	I	II	III	IV
Group 3	I	II	III/IV	IV
Group 4	II	III/IV	III/IV	IV

4. Step # 4. Obtain an Infection Control Permit:

- An Infection Control Permit and approval will be required when the Construction Activity and Risk Level indicate Class III or higher (shaded areas).
- This permit will remain posted at the worksite for the duration of the project.
- This permit will be returned to the Construction Manager or designee at the completion of the project.

5. Step # 5. Identify Areas Surrounding Project Area

Identify the **areas** surrounding the project area, assessing potential impact. *****

Identify Unit Below	**Identify Unit Above**	**Identify Lateral Unit**	**Identify Lateral Unit**	**Identify Unit Behind**	**Identify Unit Front**
Identify Risk Group: 1 2 3 4	Identify Risk Group 1 2 3 4	Identify Risk Group 1 2 3 4	Identify Risk Group 1 2 3 4	Identify Risk Group 1 2 3 4	Identify Risk Group 1 2 3 4
Potential Impact? Yes___ No___ See comments__	Potential Impact? Yes___ No___ See comments__	Potential Impact? Yes___ No___ See comments__	Potential Impact? Yes___ No___ See comments__	Potential Impact? Yes___ No___ See comments__	Potential Impact? Yes___ No___ See comments__

Comments*

_____

_____

_____***note**: Another aspect of "Areas Surrounding Project Area" are any nearby buildings where patients are present that could be in the path of blown dust coming from building demolition, excavation, foundation construction, and site work

6. Step # 6. Identify specific site of activity, e.g.: patient rooms, medication room, etc._____

_____

_____

_____

7. Step # 7. Work hours: Can or will the work be done during non-patient care hours?

Yes_____ No_____ Not applicable_____

Other_____

Infection Control Permit

Bartlett Regional Hospital Infection Control Construction Permit

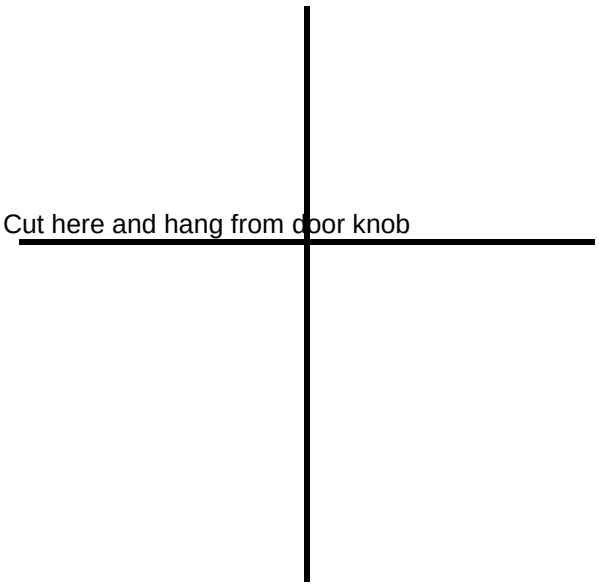
	Permit No:
Location of Construction:	Project Start Date:
Project Coordinator	Estimated Duration:
Contractor Performing Work	Permit Expiration Date:
Supervisor:	Telephone:

YES	NO	CONSTRUCTION ACTIVITY	YES	NO	INFECTION CONTROL RISK GROUP
		TYPE A: Inspection, non-invasive activity			GROUP 1: Least Risk
		TYPE B: Small scale, short duration, moderate to high levels			GROUP 2: Medium Risk
		TYPE C: Activity generates moderate to high levels of dust, requires greater 1 work shift for completion			GROUP 3: Medium/High Risk
		TYPE D: Major duration and construction activities Requiring consecutive work shifts			GROUP 4: Highest Risk

CLASS I	1. Execute work by methods to minimize raising dust from construction operations. 2. Immediately replace any ceiling tile displaced for visual inspection.	3. Minor Demolition for Remodeling
CLASS II	1. Provides active means to prevent air-borne dust from dispersing into atmosphere 2. Water mist work surfaces to control dust while cutting. 3. Seal unused doors with duct tape. 4. Block off and seal air vents. 5. Wipe surfaces with disinfectant.	6. Contain construction waste before transport in tightly covered containers. 7. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area. 8. Place dust mat at entrance and exit of work area. 9. Remove or isolate HVAC system in areas where work is being performed.
CLASS III Date Initial	1. Obtain infection control permit before construction begins. 2. Isolate HVAC system in area where work is being done to prevent contamination of the duct system. 3. Complete all critical barriers or implement control cube method before construction begins. 4. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 5. Do not remove barriers from work area until complete project is thoroughly cleaned by Env. Services Dept.	6. Vacuum work with HEPA filtered vacuums. 7. Wet mop with disinfectant 8. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. 9. Contain construction waste before transport in tightly covered containers. 10. Cover transport receptacles or carts. Tape covering. 11. Remove or isolate HVAC system in areas where work is being performed/
Class IV Date Initial	1. Obtain infection control permit before construction begins. 2. Isolate HVAC system in area where work is being done to prevent contamination of duct system. 3. Complete all critical barriers or implement control cube method before construction begins. 4. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 5. Seal holes, pipes, conduits, and punctures appropriately. 6. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave the work site.	7. All personnel entering work site are required to wear shoe covers 8. Do not remove barriers from work area until completed project is thoroughly cleaned by the Environmental Service Dept. 9. Vacuum work area with HEPA filtered vacuums. 10. Wet mop with disinfectant. 11. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. 12. Contain construction waste before transport in tightly covered containers. 13. Cover transport receptacles or carts. Tape covering. 14. Remove or isolate HVAC system in areas where is being done.

Additional Requirements:

_____ _____ Date Initials	_____ Exceptions/Additions to this permit Date, Initials are noted by attached memoranda.



Bartlett Regional Hospital

MAINTENANCE/CONSTRUCTION IN PROCESS

KEEP DOOR CLOSED

Per Infection Control Policy
Contact the Project Manager

_____

at _____ for questions

SECTION 01600 – PROTECTION REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling and comparable products.

B. Related Requirements:

1. Section 012500 "Substitution Procedures" for requests for substitutions.

1.2 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Engineer / Owner's Action: If necessary, Engineer/Owner will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Engineer/Owner will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
b. **Use product specified** if Engineer/Owner does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
3. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:
1. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
2. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
3. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
4. Protect stored products from damage and liquids from freezing.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Where products are accompanied by the term "as selected," Architect will make selection.
3. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

B. Product Selection Procedures:

1. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Engineer/Owner will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Engineer/Owner may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Installation of the Work.
3. Cutting and patching.
4. Progress cleaning.
5. Protection of installed construction.

B. Related Requirements:

1. Section 011000 "Summary" for limits on use of Project site.
2. Section 017700 "Closeout Procedures" for submitting Project Record Documents and final cleaning.

1.2 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: Do not cut or patch structural elements.

2. Operational Elements: Do not cut and patch operating elements and related components.

3. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in the Owner's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

4. PAINTING: Prime and paint all replacement gypsum board installed at patched ceiling and wall areas. Coordinate with Owner to obtain matching paint color / mix-number information. The patched ceiling in Public Corridor 2211A is to be re-painted in its entirety, from sidewall-to-sidewall, end wall-to-end wall. The patched ceiling areas in OR Corridor 2316B and OR Corridor 2316C are to be primed and re-painted at the patched areas only. Blend / feather new paint into existing. Patched walls are to be repainted in their entirety, from floor to ceiling and from corner to corner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

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

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Examine walls and ceilings for suitable conditions where products and systems are to be installed.
2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Owner/Project Manager according to requirements in Section 013100 "Project Management and Coordination."

3.3 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Conduct construction operations so no part of the Work is subjected to damaging operations.

D. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

E. Tools and Equipment: Do not use tools or equipment that produce dust and/or harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Attachment: Provide attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Owner / Project Manager.

H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Protection: Protect in-place construction during cutting and patching to prevent damage.

C. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas. Coordinate all access into the OR Corridors with Owner.

D. Cleaning: Clean areas and spaces (including areas located above ceiling assemblies) where cutting and patching work is performed. Remove paint, putty, and similar materials from adjacent finished surfaces.

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Remove all materials and debris from all work areas daily.

B. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

C. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

D. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

E. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

F. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

B. Related Requirements:
1. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
2. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.2 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.3 MAINTENANCE/REPLACEMENT MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items indicated.

1.4 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 5 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation and similar final record information.

2. Submit closeout submittals specified in individual Sections, including specific warranties, and similar documents.
3. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to BRH Facilities Manager Marc Walker. Label with manufacturer's name and model number where applicable.

    a. Obtain Facility Manager’s signature for receipt of submittals.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 5 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Terminate and remove temporary facilities from Project site, construction tools, and similar elements.
2. Complete final cleaning requirements, including touchup painting.
3. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 5 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Project Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Project Manager will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.5 FINAL COMPLETION PROCEDURES

A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Instruct Owner's personnel in maintenance of products.

B. Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, Project Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Project Manager will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected. The Owner anticipates one substantial completion

inspection and one final inspection. Additional inspections required due to incomplete work will be charged to the contractor through a credit by change order.

1.6 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties with the operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site, and grounds, in areas disturbed by construction activities, free of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove spills, stains, and other foreign deposits.
c. Remove tools, construction equipment, machinery, and surplus material from Project site.
d. Wash finish walls, ceilings and floors affected by work including newly installed materials.
e. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
f. Remove labels that are not permanent.
g. Leave Project clean and ready for occupancy.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Restore damaged construction and permanent facilities used during construction to specified condition.
   1. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

      a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
   1. Product maintenance manuals.

1.2 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in Section 230510 General Mechanical HVAC and in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

   1. Engineer will comment on whether content of operations and maintenance submittals are acceptable.

B. Format: Submit operations and maintenance manuals in the following format:

   1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Engineer.

      a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
      b. Enable inserted reviewer comments on draft submittals.

C. Manual Submittal: Submit a minimum of FOUR copies of each O&M manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Owner / Project Manager will return copy with comments.

   1. Correct or revise each manual to comply with Engineer's comments. Submit copies of each corrected manual within 7 days of receipt of Engineer's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR MAINTENANCE MANUALS

A. Directory: Prepare a single, comprehensive directory of maintenance data and materials.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Project Manager.
7. Name and contact information for Engineer.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

D. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
   1. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Configure electronic manual to display bookmark panel on opening file.

2.2 PRODUCT MAINTENANCE MANUALS

A. Content: Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

C. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

D. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

E. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

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

B. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.

B. Related Requirements:

1. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

2. Section 230510 – General Mechanical HVAC

1.2 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one (1) set of marked-up record prints.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Record data as soon as possible after obtaining it.

2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Engineer's and Project Manager's reference during normal working hours.

END OF SECTION 017839

SECTION 230510 - GENERAL MECHANICAL HVAC

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The Work includes all mechanical, automatic controls, and other related work as detailed in the drawings and specifications. The entire Specifications must be examined for requirements relating to the Work hereunder. The Work covered by this and all other Specifications sections consists of furnishing labor, equipment, and materials in accordance with the Specifications or Drawings, or both, together with any incidental items not shown or specified which can be reasonably inferred or taken as belonging to the Work and necessary in good practice to provide a complete system described or shown as intended.

B. Coordinate Work areas and shutdown of systems with OWNER. Coordinate acceptable working hours with Owner. Contact name and phone number will be available through Project Manager.

1. It is intended that the majority of new systems will be installed and ready for operation prior to shutdown of existing mechanical systems in order to minimize mechanical system downtime and impact to hospital operations. Shut downs of mechanical systems will generally occur in off hours and only with prior approval from Owner. Coordinate proposed shut down times to be for as short of time as possible. All shutdowns must be approved in advance by the Owner.
2. See Division 1 for all BRH access, shutdown, and work requirements.
3. All work within the Surgery Area (See M2.3 and M2.4) must comply with all of the safety and environmental requirements that are outlined within Section 015221 SPECIAL SAFETY REQUIREMENTS/ICRA.

C. Demolition of and Connection to Existing Material, Equipment, and Systems:

1. Where select piping and ductwork systems are shown to be partially removed for connection, prepare and protect the connection points appropriately to ensure later continuity of Work. Contractor shall provide all temporary supports as required and completely replace material and equipment that are not suitably protected during construction and becomes damaged.
2. Contractor shall provide all temporary caps for ductwork and piping as required. Contractor shall provide all temporary partitions such as air-tight air plenum separations as required to maintain continuity of systems and to not contaminate existing systems or finishes. Contractor shall remove all temporary provisions when the Work is completed or earlier if required.
3. All material and equipment that are to be removed for relocation is the Contractors responsibility to suitably protect and store in a location that protects from damage. Contractor shall completely replace all relocated material and equipment that are damaged from storage and other misuse between demolition and reinstallation.
4. Where items are shown to be removed such as piping or ductwork it is to be assumed that this includes the removal of the respective system including but not limited to pipe and duct hangers, supports, conduit, wiring, valves, and other related trim and appurtenances.

5. Contractor shall locate, isolate, and drain piping systems to be removed. Contractor responsible for recharging systems as needed for proper operation.
6. Verify all on site conditions prior to beginning Work.

1.2 WORDING OF THE SPECIFICATIONS

A. These Specifications are of the abbreviated or streamlined type and frequently include incomplete sentences. However, periods are used for clarity. Words such as "shall", "shall be", "the Contractor shall", and similar mandatory phrases shall be supplied by inference in the same manner, as they are required for the notes on the drawings.

1.3 CODES AND REGULATIONS

A. All Work hereunder shall be strictly in conformance with applicable codes and regulations. All Work shall be in accordance with the 2009 Uniform Plumbing Code, 2009 International Mechanical Code, 2009 International Building Code, 2009 International Electrical Code, 2009 International Fire Code, the most recent edition of NEC and NFPA, and City and Borough of Juneau and State of Alaska code modifications insofar as minimum requirements are concerned, but the Drawings and Specifications shall govern in case the minimum requirements are exceeded. All electrical equipment shall bear the UL label.

1.4 SUBMITTALS

A. General: Provide submittals according to Conditions of Contract, Division 1 Specifications Sections, and as required hereunder. Drawings and general provisions of the Contract, including General, Supplementary Conditions, and all Division 1 Specification Sections, apply to this Section. Approval of the data shall not eliminate responsibility for compliance with the Drawings or Specifications unless specific attention has been called in writing to proposed deviations at the time of transmittal of the data and such deviations have been approved, nor shall it eliminate the responsibility for freedom of errors of any sort in the data. All submittal data for Project construction is to be turned in for approval at the same time in order for an efficient review process. Partial submittals may be rejected until the full submittal is received.

B. Specified Products: Trade names and catalog numbers of manufactured products included herein are intended to indicate the type, size, and grade of quality of equipment and materials required and such equipment and materials are approved for installation, subject to full compliance with the Specifications. Except where single manufacture is specified for standardization, requests for approval of other manufacturers than those specified must be accompanied by complete descriptions including overall dimensions, performance data, and, if catalog material, identification of specific products or items proposed.

C. Submittal Format: All data shall be submitted at one time in neatly bound loose-leaf three ring binders with pockets and tabulated in the same order of Specification Division section. All data shall be typed, minimum 10 point font, no exceptions. Data submitted that is not conforming to these specification requirements will be returned without reviewing and will need to be resubmitted at Contractors sole complete cost.

1. Each binder shall have a set of separators with index tabs A to Z. Tabs are to be printed type. Slip-in tabs not acceptable.
2. The first page shall be a cover sheet with project name, address, date, submittal product name, all applicable contractors and contact information, and all applicable consultants and contact information.
3. Second page shall be a submittal manual index of all project Specification sections with respective tab numbers, and respective book number, if applicable.
4. The first page of each manuals section shall be an index of that respective project Specification section and number with each product name, manufacturer name and model number.
5. Each manuals section shall be labeled and certified by Subcontractor that the data presented is in accordance with project Specifications. Index sheet in front of completed binder listing each piece of equipment or material submitted.
6. Product Data to be utilized shall be flagged and noted and all other data shall be crossed out or otherwise flagged that it is not in the project.
7. Data shall be inserted in binders in order of Specification number. Specification number shall be clearly labeled on each submittal page.

D. As-built Drawings: As-built drawings shall be required from all Contractors and shall accurately show all changes from Contract Documents for all piping, ductwork, electrical, controls, and equipment. Piping diagram as-builts shall be provided in addition to floor plan as-builts. As-built drawings shall be updated daily and available for inspection on-site by the Architect.

E. Operating and Maintenance Data: See Division 1 for the number of sets of data to be provided for submittal and additional requirements. Provide a minimum of four (4) copies. The data shall be provided to the Project Manager for approval 10 days prior to the request for Substantial Completion inspection. The data shall be provided complete at one time. Partial or separate data will be returned for completion. The valve directory and nameplate directory may be provided for approval previous to the other data. The first section of the O&M manual shall be as listed in the following subparagraphs in order presented hereunder. All of the following subparagraphs sections shall be furnished with permanent plastic see through covers. See requirements under 1.4.C for additional submittal and formatting requirements.

F. Guide Documents: Sample operating and maintenance instructions and maintenance schedule may be obtained from the Architect upon request, to assist in properly setting up the data.

G. Instructions To Personnel and Training: The Contractor shall instruct operating personnel in the operation and maintenance of the systems before accepting the responsibility of operation and maintenance of the systems. Each training session shall be signed off by Project Manager. Training shall occur for all systems. See individual specification sections for additional and specific requirements.

H. Qualification Data: For sheet metal installers. For pipe fitters. For electrical and controls installers.

I. Submit prior to Substantial Completion Inspection and Final Inspection a detailed list of equipment and systems that will not be completed for the completion date. Include status and information of deficiencies from all previous inspection reports.

J. Submit prior to Re-inspections of Substantial Completion Inspections, if applicable, and the Final Inspection a marked copy of the previous Engineers Inspection Reports detailing all items that have been completed and all items that have not been completed with reasons thereof. Re-inspection or Final Inspection will not occur until receipt of this list.

1.5 COOPERATIVE WORK

A. The Work hereunder shall be coordinated between various contractors and with the Work specified toward rapid completion of the entire Project. If any cooperative Work must be altered due to lack of proper supervision hereunder, or failure to make proper provisions in time, then the Work hereunder shall include all expense of such changes as are necessary to be made in the Work under other divisions and contracts, and such changes shall be directly supervised by the Project Manager and shall be made to the satisfaction of the Project Manager.

B. Protection of existing mechanical material and equipment during selective demolition shall be the responsibility of the Contractor and coordinated with the respective Contractors. The Contractor shall provide temporary supports for all material and equipment. The Contractor at no cost to the Owner shall replace any existing material or equipment damaged during selective demolition due to insufficient protection. Coordination with all disciplines is required.

1.6 QUALITY ASSURANCE

A. Perform Work in conformance with all applicable codes, regulations, local ordinances, contract documents, and generally accepted good practice. If discrepancies exist between Specifications and Contract Drawings then the solution that provides the Owner with the highest quality of product or installation shall be deemed as intended by the Contract Documents.

B. All sheet metal workers shall have a minimum documented sheet metal fabrication and installation experience in commercial or industrial facilities of 3 years or be enrolled in an Alaska Department of Labor approved Sheet Metal Apprentice program. The ratio of on-site workers shall not exceed 3 apprentices or sheet metal workers for every one foreman. A foreman is defined as a sheet metal worker with minimum 3 years experience as detailed above or is an approved Journeyman.

C. All Plumbers and Pipe Fitters shall have a minimum documented installation experience in commercial or industrial facilities of 3 years or be enrolled in an Alaska Department of Labor approved Plumbers and Pipe Fitters Apprentice program. The ratio of on-site workers shall not exceed 2 apprentices or pipe fitters for every one Journeyman.

1.7 FIELD MEASUREMENTS

A. See Division 1 for specific requirements.

B. Verifications: All measurements shall be verified at the site and prior to fabrications of equipment and systems. The existing conditions shall be fully observed before beginning the Work hereunder, and the Work hereunder executed in full coordination with the existing conditions observed. All hazardous material including asbestos materials that are discovered during the course of construction shall be immediately brought to the attention of the Project

Manager for action. All Work performed with hazardous materials not approved by the Owner shall be at the full responsibility of the contractor and not the Owner.

C. Changes: Variations apparently necessary due to existing conditions shall be made only on approval in writing by the Project Manager.

1.8. TRANSPORTATION TO SITE AND ON-SITE STORAGE

A. Protection: Materials and equipment which are intended to be installed and operated inside completed building envelope shall be protected. It is Contractor's responsibility to deliver all material and equipment to Owner at completion of WORK in an "as new condition." "As new condition" shall mean free of corrosion, dirt, rust, stain, or physical damage resulting from or during transportation to site, temporary storage at site, and construction period. Contractor must address potential damage to material and equipment caused by exposure to elements including wind, rain, and construction process. Contractor shall take all precautions to protect material and equipment. Precautions shall include, but not be limited to, protection from moisture to ensure materials and equipment remain dry, and equipment is reasonably free of debris. Material and equipment which have been exposed to moisture are subject to timely replacement by Contractor at no additional cost to Owner.

1.9 WARRANTY

A. See Division 1 for specific requirements regarding: Product warranties and product Bonds.

B. The contractor shall provide continuous and generally trouble-free operation of the systems for the time period listed in Division 1 or for one year after Substantial Completion whichever time period is longer. The operation and maintenance of systems other than incidental operations such as room thermostat settings or changing of air filters, shall be the sole responsibility of the contractor and shall be addressed by the contractor immediately if deficiencies are present. Leaking of valves, flanges, or air vents shall be addressed immediately by the contractor during the warranty period. Control settings, noise problems, and other deficiencies resulting in unsatisfactory environmental conditions shall be addressed immediately.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 23 0510

SECTION 230519 -METERS AND GAGES FOR HVAC PIPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Pressure gages and pressure gage taps.

B. Thermometers and thermometer wells.

C. Test Ports.

1.2 RELATED REQUIREMENTS

A. Section 23 2113 - Hydronic Piping.

B. Section 23 0926 - Building Automation System and Controls.

1.3 REFERENCE STANDARDS

A. ASME B40.100 - Pressure Gauges and Gauge Attachments; The American Society of Mechanical Engineers; 2005.

B. ASTM E1 - Standard Specification for ASTM Thermometers; 2007.

C. ASTM E77 - Standard Test Method for Inspection and Verification of Thermometers; 2007.

D. UL 393 - Indicating Pressure Gauges for Fire-Protection Service; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

1.4 SUBMITTALS

A. See Section 01 3300 Submittal Procedures.

B. Product Data: Provide list that indicates use, operating range, total range and location for manufactured components.

1. Manufacturer’s data indicating use, operating range, total range, accuracy, and location for manufactured components.
2. Submit product description, model, dimensions, component sizes, rough-in requirements, service sizes, and finishes.
3. Submit schedule indicating manufacturer, model number, size, location, rated capacity, load served, and features for each specialty.
4. Submit schedule of pressure gage and thermometers detailing service and scale.

C. Project Record Documents: Record actual locations of components and instrumentation.

D. Operation and Maintenance Data.

E. Maintenance Materials: Furnish the following for OWNER's use in maintenance of project.

1. Extra Pressure Gages and Thermometers: One of each type and size.

1.5 FIELD CONDITIONS

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

PART 2 - PRODUCTS

2.1 PRESSURE GAGES

A. Manufacturers:

1. Dwyer Instruments, Inc
2. Moeller Instrument Co., Inc
3. Omega Engineering, Inc

B. Pressure Gages: ASME B40.100, UL 393 drawn steel case, phosphor bronze bourdon tube, rotary brass movement, brass socket, with front recalibration adjustment, black scale on white background. Liquid filled to dampen vibration. Suitable for steam and chilled water systems.

1. Case: Stainless Steel.
2. Bourdon Tube: Stainless Steel
3. Socket: Stainless Steel
4. Size: 4-1/2 inch diameter.
5. Mid-Scale Accuracy: One percent.
6. Scale: Psi and KPa. 0-30 Psi for Steam and 0-50 psi for Chilled Water.

2.2 PRESSURE GAGE TAPPINGS

A. Gage Cock: Tee or lever handle, brass for maximum 150 psi.

B. Syphon: Steel, Schedule 40, 1/4 inch angle or straight pattern.

2.3 SOLAR POWERED THERMOMETERS

A. Manufacturers:

1. Weiss
2. Weksler
3. FNW brand not acceptable.

B. Thermometer: Adjustable angle, digital solar powered thermometer, with positive locking

device.

1. Stem: Brass, 3/4 inch NPT, 3-1/2 inch long.
2. Accuracy: 2 percent.
3. Calibration: Both degrees F and degrees C.

2.4 THERMOMETER SUPPORTS

A. Socket: Brass separable sockets for thermometer stems with or without extensions as required, and with cap and chain.

B. Flange: 3 inch outside diameter reversible flange, designed to fasten to sheet metal air ducts, with brass perforated stem.

2.5 TEST PLUGS

A. Test Plug: 1/4 inch NPT or 1/2 inch NPT brass self sealing fitting and screw type sealing cap for receiving 1/8 inch outside diameter pressure or temperature probe with Nordel core for temperatures up to 350 degrees F.

B. Test Kit: Carrying case, internally padded and fitted containing one 2-1/2 inch (60 mm) diameter pressure gages, one gage adapters with 1/8 inch (3 mm) probes, two 1 inch (25 mm) dial thermometers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide two pressure gages per pump, installing taps before strainers and on suction and discharge of pump. Pipe to gage.

C. Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2 inch for installation of thermometer sockets. Ensure sockets allow clearance from insulation.

D. Install thermometers in air duct systems on flanges.

E. Install thermometer sockets adjacent to controls systems thermostat, transmitter, or sensor sockets. Where thermometers are provided on local panels, duct or pipe mounted thermometers are provided on local panels, duct or pipe mounted thermometers are not required.

F. Locate duct mounted thermometers minimum 5 feet downstream of mixing dampers, coils, or other devices causing air turbulence.

G. Coil and conceal excess capillary on remote element instruments.

H. Provide instruments with scale ranges selected according to service with largest appropriate scale.

I. Install gages and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.

J. Adjust gages and thermometers to final angle, clean windows and lenses, and calibrate to zero.

K. Locate test plugs adjacent to pressure gages and pressure gage taps.

L. Install pressure gages with pulsation dampers. Provide gage cock to isolate each gage. Provide siphon on gages in steam systems. Extend nipples and siphons to allow clearance from insulation.

END OF SECTION 23 0519

SECTION 230553 -IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Nameplates.

B. Tags.

C. Pipe Markers.

1.2 REFERENCE STANDARDS

A. ASME A13.1 - Scheme for the Identification of Piping Systems; The American Society of Mechanical Engineers; 2007.

B. ASTM D709 - Standard Specification for Laminated Thermosetting Materials; 2001 (Reapproved 2007).

1.3 SUBMITTALS

A. See Section 01 3300 - Administrative Requirements, for submittal procedures.

B. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number. Coordinate numbering with existing valve chart.

C. Product Data: Provide manufacturers catalog literature for each product required.

D. Manufacturer's Installation Instructions: Indicate special procedures, and installation.

E. Project Record Documents: Record actual locations of tagged valves.

PART 2 - PRODUCTS

2.1 NAMEPLATES

A. Manufacturers:

1. Kolbi Pipe Marker Co
2. Seton Identification Products.

B. Description: Laminated three-layer plastic with engraved letters.

1. Letter Color: White.
2. Letter Height: 1/4 inch.
3. Background Color: Black.
4. Plastic: Conform to ASTM D709.

2.2 TAGS

A. Manufacturers:

1. Advanced Graphic Engraving
2. Brady Corporation
3. Kolbi Pipe Marker Co
4. Seton Identification Products

B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

C. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame. Coordinate with existing valve tag chart for numbering.

2.3 PIPE MARKERS

A. Manufacturers:

1. Brady Corporation
2. Kolbi Pipe Marker Co
3. MIFAB, Inc
4. Seton Identification Products

B. Comply with ASME A13.1.

C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

D. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed. For un-insulated piping only.

PART 3 - EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

B. Symbols, numbers, and all mechanical identification shall match and be in accordance with

Contract Documents.

3.2 INSTALLATION

A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.

B. Install tags with corrosion resistant chain.

C. Install plastic pipe markers in accordance with manufacturer's instructions.

D. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.

E. Piping located on the roof is to be labeled immediately within each adjacent penthouse. Piping on roof shall not be labeled.

F. Use tags on piping 3/4 inch diameter and smaller.

1. Identify service, flow direction, and pressure.
2. Install in clear view and align with axis of piping.
3. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.

G. Identify chiller, expansion tank, glycol fill tank, duct humidifier, and control panels with plastic nameplates. Small devices, such as in-line pumps, may be identified with tags.

H. Identify valves in main and branch piping with tags.

I. Identify piping, concealed or exposed, with plastic pipe markers or plastic tape pipe markers.

1. Plastic pipe markers are to be used on uninsulated piping only.
2. Identify service, flow direction, and pressure.
3. Install in clear view and align with axis of piping.
4. Locate identification not to exceed 15 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
5. Inaccessible piping need not be indentified if piping is identified at nearest accessible or exposed locations.
6. Install identifying devices after completion of coverings and painting.

END OF SECTION 23 0553

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Testing, adjustment, and balancing of select air systems serving the OR Surgery suites.

B. Testing, adjustment, and balancing of chilled water systems.

C. Measurement of final operating condition of HVAC systems.

1.2 REFERENCE STANDARDS

A. AABC MN-1 - AABC National Standards for Total System Balance; Associated Air Balance Council; 2002.

B. ASHRAE Std 111 - Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems; American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

C. NEBB (TAB) - Procedural Standards for Testing Adjusting Balancing of Environmental Systems; National Environmental Balancing Bureau.

D. SMACNA (TAB) - HVAC Systems Testing, Adjusting, and Balancing; Sheet Metal and Air Conditioning Contractors' National Association.

1.3 SUMMARY

A. Scope of Work: Adjust and balance the air and water systems as detailed below. Water flow rates are indicated on the drawings. Coordinate with contract document and sequence of operations for all requirements.

1. ASU-11: Measure SA and RA for each of the (3) OR Surgery suites. Measure total airflow into each OR suite and return air out of each OR suite. Adjust return dampers only as needed to achieve the positive pressure as required for operating rooms.
2. Adjust chilled water system to flow rates indicated on chilled water piping diagram.
3. Provide assistance to automatic controls contractor during start-up and testing. Work with BAS Contractor to measure duct air temperatures and humidity levels at various operating conditions indicated in the 23 0926 sequence of operations. Assist in calibration of sensors if needed.
4. Provide measurement of existing ASU-11 SF performance.
5. Provide measurement of existing ASU-11 cooling coil performance.
6. Provide measurement of water cooled chiller WWCU-1 performance.

1.4 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Qualifications: TAB Contractor and on-site TAB supervisor/technician shall have extensive experience with Hospital operating room IAQ requirements and testing, adjusting, and balancing of these spaces. TAB Contractor and on-site TAB supervisor/technician shall have specific experience with the existing BRH ASU-11 and surgery suite HVAC system. Submit name of adjusting and balancing agency and TAB supervisor with supporting documentation for approval within 30 days after award of Contract.

C. Control System Coordination Reports: Communicate in writing to the Owner and controls installer all setpoint and parameter changes made or problems and discrepancies identified during TAB that affect, or could affect, the control system setup and operation.

D. Progress Reports. TAB Contractor shall report directly to the Owner in addition to the Contractor.

E. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.

1. Revise TAB plan to reflect actual procedures and submit as part of final report.
2. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Owner and Engineer and for inclusion in operating and maintenance manuals.
3. Provide reports in soft cover, letter size, 3-ring binder manuals, complete with index page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.
4. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
5. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
6. Units of Measure: Report data in I-P (inch-pound) units only.
7. Include the following on the title page of each report:

    a. Name of Testing, Adjusting, and Balancing Agency.
    b. Address of Testing, Adjusting, and Balancing Agency.
    c. Telephone number of Testing, Adjusting, and Balancing Agency.
    d. Project name.
    e. Project location.
    f. Project Architect.
    g. Project Engineer.
    h. Project Contractor.
    i. Project altitude.
    j. Report date.

F. Project Record Documents: Record actual locations of flow measuring stations and balancing valves and rough setting.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

A. Perform total system balance in accordance with one of the following:

1. AABC MN-1, AABC National Standards for Total System Balance.
2. ASHRAE Std 111, Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems.
3. NEBB Procedural Standards for Testing Adjusting Balancing of Environmental Systems.
4. SMACNA HVAC Systems Testing, Adjusting, and Balancing.
5. Maintain at least one copy of the standard to be used at project site at all times.

B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project. Adjustment of Surgery return air dampers shall occur as soon after install of new balancing dampers as possible.

C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.

D. TAB Agency Qualifications:

1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.

2. Having minimum of three years documented experience in similar size system.

3. Certified by one of the following:

a. AABC, Associated Air Balance Council: www.aabchq.com; upon completion submit AABC National Performance Guaranty.
b. NEBB, National Environmental Balancing Bureau: www.nebb.org.
c. TABB, The Testing, Adjusting, and Balancing Bureau of National Energy Management Institute: www.tabbcertified.org.
d. Professional mechanical engineer with documented TAB experience within the last two years.

4. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.

5. TAB Agency and on-site TAB supervisor/technician shall have extensive experience with Hospital operating room IAQ requirements and testing, adjusting, and balancing of these spaces. TAB Agency and on-site TAB supervisor/technician shall have specific experience with the existing BRH ASU-11 and surgery suite HVAC system.

3.2 EXAMINATION

A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:

1. Systems are started and operating in a safe and normal condition.
2. Temperature control systems are installed complete and operable.
3. Proper thermal overload protection is in place for electrical equipment.
4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
5. Duct systems are clean of debris.
6. Fans are rotating correctly.
7. Fire and volume dampers are in place and open.
8. Air coil fins are cleaned and combed.
9. Access doors are closed and duct end caps are in place.
10. Air outlets are installed and connected.
11. Duct system leakage is minimized.
12. Hydronic systems are flushed, filled, and vented.
13. Pumps are rotating correctly.
14. Proper strainer baskets are clean and in place.
15. Service and balance valves are open.

B. Submit field reports. Report defects and deficiencies that will or could prevent proper system balance.

C. Beginning of work means acceptance of existing conditions.

3.3 ADJUSTMENT TOLERANCES

A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.

B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

C. Hydronic Systems: Adjust to within plus or minus 10 percent of design.

3.4 RECORDING AND ADJUSTING

A. Field Logs: Maintain written logs including:

1. Running log of events and issues.
2. Discrepancies, deficient or uncompleted work by others.
3. Contract interpretation requests.
4. Lists of completed tests.

B. Ensure recorded data represents actual measured or observed conditions.

C. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.

D. Mark on the drawings the locations where traverse and other critical measurements were taken and cross reference the location in the final report.

E. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.

F. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

3.5 AIR SYSTEM PROCEDURE

A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.

B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.

C. Measure air quantities at air inlets and outlets.

D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.

E. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.

F. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.

G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.

I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.

J. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance systems at full outdoor air and at minimum outdoor air flow rate.

K. Measure room static pressures and adjust supply, return, and exhaust air systems to provide required relationships.

L. Yearly IAQ balance reports will be available for reference upon request during construction.

3.6 WATER SYSTEM PROCEDURE

A. Adjust water systems to provide required or design quantities.

B. Use calibrated Venturi tubes, orifices, or other metered fittings and pressure gauges to determine flow rates for system balance. Where flow metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in the system.

C. Adjust systems to provide specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.

D. Effect system balance with automatic control valves fully open to heat transfer elements.

E. Effect adjustment of water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point.

F. Where available pump capacity is less than total flow requirements or individual system parts, full flow in one part may be simulated by temporary restriction of flow to other parts.

G. Pumps: Adjust to design GPM.

H. Measure and assist BAS Contractor in calibration of flow meters.

3.7 SCOPE

A. Scope of Work: Adjust and balance the air and water systems as detailed below. Water flow rates are indicated on the drawings. Coordinate with contract document and sequence of operations for all requirements.

1. ASU-11: Measure SA and RA for each of the (3) OR Surgery suites. Measure total airflow into each OR suite and return air out of each OR suite. Adjust return dampers only as needed to achieve the positive pressure as required for operating rooms.
2. Adjust chilled water system to flow rates indicated on chilled water piping diagram.
3. Provide assistance to automatic controls contractor during start-up and testing. Work with BAS Contractor to measure duct air temperatures and humidity levels at various operating conditions indicated in the 23 0926 sequence of operations. Assist in calibration of sensors if needed.
4. Provide measurement of existing ASU-11 SF performance.
5. Provide measurement of existing ASU-11 cooling coil performance.
6. Provide measurement of water cooled chiller WWCU-1 performance.

3.8 MINIMUM DATA TO BE REPORTED

A. Electric Motors:

1. Manufacturer
2. Model/Frame

3. HP/BHP
4. Phase, voltage, amperage; nameplate, actual, no load
5. RPM
6. Service factor
7. Starter size, rating, heater elements

B. Air Moving Equipment (ASU-11 SF): (Design values shall be taken from IAQ Balance Reports available from Owner during Construction)

1. Location
2. Manufacturer
3. Model number
4. Serial number
5. Arrangement/Class/Discharge
6. Air flow, specified and actual
7. Return air flow, specified and actual
8. Outside air flow, specified and actual
9. Total static pressure (total external), specified and actual
10. Inlet pressure
11. Discharge pressure
12. Sheave Make/Size/Bore
13. Number of Belts/Make/Size
14. Fan RPM

C. Operating Room (OR-1, OR-2, OR-3):

1. Location
2. Supply air volume total; Design and Actual
3. Return air volume total; Design and Actual
4. Static Pressure Profile for Operating Room, OR-X. Must be positive pressure per hospital TAB standards.

D. Duct Traverses:

1. System zone/branch
2. Duct size
3. Area
4. Design velocity
5. Design air flow
6. Test velocity
7. Test air flow
8. Duct static pressure
9. Air temperature

E. Pump (CWP-4):

1. Identification/number
2. Manufacturer
3. Size/model
4. Impeller
5. Service
6. Design flow rate, pressure drop, BHP
7. Actual flow rate, pressure drop, BHP
8. Discharge pressure
9. Suction pressure
10. Total operating head pressure
11. Shut off, discharge and suction pressures
12. Shut off, total head pressure
13. Pump speed setting
14. Electrical

F. Cooling Coil (Existing ASU-11 CC):

1. Identification/number
2. Location
3. Service
4. Manufacturer
5. Air flow, design and actual
6. Water flow, design and actual
7. Water pressure drop, design and actual
8. Entering water temperature, design and actual
9. Leaving water temperature, design and actual
10. Entering air temperature, design and actual
11. Leaving air temperature, design and actual
12. Air pressure drop, design and actual

G. Chiller:

1. Identification/number
2. Location
3. Manufacturer
4. Model number
5. Water Flow Rate, design and actual – Evaporator Side. Glycol Percentage.
6. Water Flow Rate, design and actual – Condenser Side
7. Entering water temperature, design and actual – Evaporator Side
8. Leaving water temperature, design and actual – Evaporator Side
7. Entering water temperature, design and actual – Condenser Side
8. Leaving water temperature, design and actual – Condenser Side
9. Water Pressure Drop – Evaporator Side

10. Water Pressure Drop – Condenser Side
11. Electrical nameplate data
12. Operating electrical measurements

END OF SECTION 23 0593

SECTION 230713 - DUCT INSULATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Duct insulation.

1.2 RELATED REQUIREMENTS

A. Section 23 0553 - Identification for HVAC Piping and Equipment.

B. Section 23 3100 – HVAC Ducts and Accessories.

1.3 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2010.

B. ASTM C553 - Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2008.

C. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2010.

D. ASTM C916 - Standard Specification for Adhesives for Duct Thermal Insulation; 1985 (Reapproved 2007).

E. ASTM C1290 - Standard Specification for Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts; 2011.

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2010b.

G. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2010.

H. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials; National Fire Protection Association; 2006.

I. SMACNA (DCS) - HVAC Duct Construction Standards - Metal and Flexible; Sheet Metal and Air Conditioning Contractors' National Association; 2005.

J. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

1.4 SUBMITTALS

A. See Section 01 3300 Submittal Procedures.

B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

C. Manufacturer's Instructions: Indicate installation procedures necessary to ensure acceptable workmanship and that installation standards will be achieved.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section with not less than three years of documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified in this section, with minimum three years of experience and approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.7 FIELD CONDITIONS

A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.

B. Maintain temperature during and after installation for minimum period of 24 hours.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR ALL PRODUCTS OF THIS SECTION

A. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, NFPA 255, or UL 723.

2.2 GLASS FIBER, RIGID

A. Manufacturer:

1. Knauf Insulation.
2. Johns Manville Corporation.
3. Owens Corning Corp.
4. CertainTeed Corporation.

B. Insulation: ASTM C612; rigid, noncombustible blanket.

1. 'K' value: 0.24 at 75 degrees F, when tested in accordance with ASTM C518.
2. Maximum service temperature: 450 degrees F.
3. Maximum Water Vapor Absorption: 5.0 percent.
4. Maximum Density: 8.0 lb/cu ft.

C. Vapor Barrier Jacket:

1. Kraft paper with glass fiber yarn and bonded to aluminized film.
2. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
3. Secure with pressure sensitive tape.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that ducts have been tested before applying insulation materials.

B. Verify that surfaces are clean, foreign material removed, and dry.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NAIMA National Insulation Standards.

C. Ducts serving OR Surgery Suites (Repair at duct modification work):

1. Provide insulation with vapor barrier jackets.
2. Finish with tape and vapor barrier jacket.
3. Re-insulate ductwork where modifications to existing ducts occur for installation of new balancing dampers.

3.3 SCHEDULES

A. Duct System Insulation:

1. Re-insulate ductwork where modifications to existing ducts occur for installation of new balancing dampers. 2 inches thick. Match existing.

END OF SECTION 23 0713

SECTION 230719 - HVAC PIPING AND EQUIPMENT INSULATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Piping insulation.

B. Jackets and accessories.

1.2 RELATED REQUIREMENTS

A. Section 23 2113 - Hydronic Piping: Placement of hangers and hanger inserts.

1.3 REFERENCE STANDARDS

A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot Plate Apparatus; 2013.

B. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement; 2007.

C. ASTM C 203 Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation

D. ASTM C 209 Water Absorption (D 2842: 96-hour immersion; C272: 24-hour immersion)

E. ASTM C 272 Test Method for determining water absorption via 24 hour immersion

F. ASTM C 273 Test method for determining shear strength

G. ASTM C 355 Water Vapor Transmission

H. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2010.

I. ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2008.

J. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2012.

K. ASTM C 591 Standard Specification for Unfaced Preformed Rigid Cellular Polyurethane Thermal Insulation. Covers unfaced, preformed rigid cellular polyisocyanurate plastic material intended for use at temperatures up to 300°F. Replaces federal specification HH-I-53

L. ASTM C 871-00 Test Methods for Chemical Analysis of Thermal Insulation Materials for Leachable Chloride, Fluoride, Silicate, and Sodium Ions

M. ASTM C 921 Standard Practice for Determining the Properties of Jacketing Material for Thermal Insulation

N ASTM 1136 Standard for vapor retarders

O. ASTM D 1621 Test Method for Compressive Properties of Rigid Cellular Plastics

P. ASTM D 1622 Test Method for Apparent Density of Rigid Cellular Plastics

Q. ASTM D 1623 Test Method for Tensile Strength

R. ASTM D 2126 Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging

S. ASTM D 2842 Test Method for Water Absorption (96-hour immersion)

T. ASTM D 2856 Test Method for Open Cell Content of Rigid Cellular Plastics By the Air Pycnometer

U. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.

V. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials; 2012.

W. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials; National Fire Protection Association; 2006.

X. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

1.4 SUBMITTALS

A. See Section 01 3300 Submittal Procedures.

B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations. Provide manufacturer's technical data, details, and specifications giving information on material composition and physical properties of the insulation, vapor retarders, and jacketing, if used. Also include:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Manufacturer/supplier installation instructions or methods.

C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

D. Qualifications: Submit name of insulator company and experience for approval within 30 days after award of Contract. Insulator company and installer must have prior experience with specific insulation material and cover system specified for this project.

E. Manufacturer's Certificate: Certify stated R-values (aged) and flame spread/smoke development ratings are in accordance with laboratory testing from certified laboratories.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified in this section with minimum three years of experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

B. Deliver materials in manufacturer's original, unopened, undamaged containers with shipping labels intact. The manufacturer's plastic wrapping is provided for protection during shipment only. Replace insulation that is damaged by physical abuse or water.

C. Store products off the ground, in dry conditions, under cover and in manufacturer's unopened packaging until ready for installation.

1.7 FIELD CONDITIONS

A. Maintain environmental conditions within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Maintain ambient conditions required by manufacturers of adhesives, vapor retarders, sealants, etc.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR ALL PRODUCTS OF THIS SECTION

A. Surface Burning Characteristics (Interior Piping Insulation only): Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, NFPA 255, or UL 723.

B. Polyiso material shall not be produced with, or contain, any of the United States EPA regulated CFC compounds listed in the Montreal Protocol of the United Nations Environmental Program.

2.2 GLASS FIBER FOR INTERIOR PIPING

A. Manufacturers:

1. Knauf Insulation
2. Johns Manville Corporation
3. Owens Corning Corp
4. CertainTeed Corporation

B. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.

1. 'K' value: ASTM C177, 0.24 at 75 degrees F.
2. Maximum service temperature: 850 degrees F.
3. Maximum moisture absorption: 0.2 percent by volume.

C. Vapor Barrier Jacket: White kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches.

D. Vapor Barrier Lap Adhesive:

1. Water based insulation adhesive, UL classified. Compatible with insulation.

2.3 PVC JACKETS FOR INTERIOR PIPING

A. PVC Plastic.

1. Manufacturers:

a. Johns Manville Corporation
b. Proto/Knauf
c. Speedline

2. Jacket: One piece molded type fitting covers and sheet material, off-white color.

a. Minimum Service Temperature: 0 degrees F.
b. Maximum Service Temperature: 150 degrees F.
c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
d. Thickness: 10 mil.
e. Connections: Brush on welding adhesive.

3. Covering Adhesive Mastic:

a. Compatible with insulation.

2.4 EXTERIOR PIPING INSULATION SYSTEM

A. Manufacturers (Polyisocyanurate):

1. Dyplast Products (Design Manufacturer)
2. Dow Chemical
3. Elliott Company
4. Duna USA

B. Insulation: 2 lb/ft3 density Polyisocyanurate pipe insulation (Dyplast ISO-C1/20). 1-1/2 Inch thickness.

1. Compressive Strength: minimum 25 psi (172 kPa) Parallel to Rise (thickness)
2. Shear Strength: minimum 28 psi (193 kPa) Parallel and Perpendicular
3. Tensile Strength: minimum 30 psi (206 kPa) Parallel and Perpendicular
4. Flexural Strength: minimum 45 psi (310 kPa) Parallel and Perpendicular
5. Dimensional Stability: <1 percent linear change (7 days) at -40 degrees F and +158 degrees F (-40 degrees C and +70 degrees C, respectively)
6. Water Vapor Permeance: less than or equal to 3 perm-inch (4.4 ng/(Pa*s*m)).
7. Water Absorption: < 1 percent by volume; D 2842 (96-hour immersion) < 2 percent by volume
8. Flame Spread/Smoke Development Class 1 ratings per ASTM E-84, as certified by FM
9. Service Temperature: -297 degrees to 300 degrees F (-183 degrees C to +149 degrees C).
10. R-value: minimum 5.7 hr*ft2*F/BTU after 6 months aging
11. K-value: maximum 0.176 BTU*in/hr*ft2*F after 6 months aging
12. Fabrication tolerance: 1/16-inch

C. Insulation Joint Non-Setting Sealer: Zero perm vapor retarder type

1. Fosters Foamseal 30-45
2. Childers CP-70
3. Epolux Cadaseal 745

D. Tape: Polyiso insulation shall be secured to the pipe with filament-reinforced tape, such as the synthetic filament-reinforced polyester film backing tape with non-thermosetting rubber adhesive, wrapped on a 3 inch paper core manufactured by 3M.

E. Vapor Retarder: Cross-laminated high density polyethylene sheeting such as Polyguard Insulrap, or polyvinylidene chloride polymer film. Install vapor retarder around polyiso insulation.

1. Polyguard Products, inc. Insulrap 30, Insulrap 50
2. Alpha Associates Inc. Alpha-Alaflex Style 13 MAM
3. TGH-1000 VB

F. Aluminum Jacket: 0.016 inch thick plain, smooth, rolled aluminum jacket. ASTM B209. Banding for jacketing shall be 0.02" thick by 1/2" wide stainless steel. Outdoor jacketing overlap shall be a minimum of 2" at butt joints and a minimum of 2” at longitudinal joints.

Jacketing shall be caulked before closing and banding and positioned in an orientation to avoid water infiltration.

1. Standard Metal Industries (www.smimetal.com)
2. RPR Products (www.rprhouston.com)
3. Childers

G. Aluminum Jacket Two-piece Die-Formed 45 and 90 Ell Covers. Aluminum jacketing for all fittings, tees, elbows, valves, caps, etc. shall be sectional, factory contoured, or field fabricated to fit closely around insulation.

1. Standard Metal Industries, Ell-Jac
2. RPR, 2-Piece Aluminum Elbow Covers
3. Pabco, Sure-Fit Elbow Covers
4. Childers

H. Jacket Joint Caulking: Caulking Sealant, Silicone Rubber Compound

1. Dow Corning, Silastic 732 RTV, 999 RTV
2. Rhone-Poulene, Rhodorsil 3B-2542 (Aluminum)
3. Pecora, 863 Silicone Sealant 345 (White)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that piping has been tested and approved before applying insulation materials.

B. Verify that surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NAIMA National Insulation Standards.

C. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, and flanges.

D. Apply insulation close to equipment by grooving, scoring, and beveling insulation.

E. Fill joints, cracks, seams, and depressions with cement or sealant to form smooth surface.

F. Equipment or Accessories Requiring Access for Maintenance, Repair, or Cleaning: Install insulation so it can be easily removed and replaced without damage.

G. Inserts and Shields:

1. Application: Piping 1-1/2 inches diameter or larger.
2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
3. Insert location: Between support shield and piping and under the finish jacket.
4. Insert configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
5. Insert material: Heavy density insulating material suitable for the planned temperature range.

H. Install insulation continuously on surfaces to be insulated without gaps.

I. Locate seams in least visible location and to protect from water intrusion. Extend surface finishes to protect raw edges, ends and surfaces of insulation.

J For entire chilled water piping system where vapor retarder facing or jacketing is specified, maintain continuous, unbroken moisture and vapor seal; insulate and vapor seal all hangers, supports, anchors, and other projections secured to cold surfaces to prevent condensation; repair penetrations and damage to vapor retarder using joint tape prior to system startup.

K. Exterior chilled water piping system is heat traced. Coordinate installation of insulation with Electrical for installation of heat trace.

L. Install aluminum jacket around entire exterior chilled water piping system with seams and rivets on bottom to allow drainage.

3.3 SCHEDULE

A. Scope of Work:

1. Insulate all new exterior piping and cover with aluminum jacket system. Piping will be heat traced. Coordinate with electrical.

2. Insulate entire new and modified chilled water piping located in interior of building.

3. Patch insulation where required due to connection to existing piping.

B. Piping Systems:

1. Interior Chilled Water Supply and Return: Mineral fiber pipe insulation: Thickness of 1-1/2 inch. Cover elbows and fittings with PVC.

2. Exterior Chilled Water Supply and Return: Polyisocyanurate pipe insulation. Thickness of 1-1/2 inch. Seal insulation joints. Install vapor retarder sheet. Cover with aluminum jacket system. Fill jacket joints with caulking.

END OF SECTION 23 0719

SECTION 23 0926 - BUILDING AUTOMATION SYSTEM AND AUTOMATIC CONTROLS

PART 1 - GENERAL

1.1 OVERVIEW

A. Furnish all labor materials, equipment, and service necessary for the addition to and modification of the existing HVAC control system for the BRH OR Surgery Ventilation System Upgrade project. Work includes the modification to an existing Siebe and T.A.C. DDC control system serving the ASU-11 (Surgery) fan system, the OR Surgery Suite HVAC system, and the chilled water system. Work also includes the modification to the existing software, programming, and graphics system. All building controllers, application controllers, and all input/output devices shall communicate using the protocols and network standards as defined by ANSI/ASHRAE Standard 135, BACNet. All workstations and controllers, including unitary controllers, shall be native BACNet devices.

B. General: The control system shall consist of a high-speed, peer-to-peer network of DDC controllers, a control system server, and operator interface.

C. System shall integrate with the existing Siebe and T.A.C. control system, software, and graphics currently installed. Work shall be provided by technicians and programmers trained on the existing control system.

1.2 QUALITY ASSURANCE

A. The control contractor shall maintain an office in Juneau or Anchorage with repair parts and maintenance personnel to ensure prompt response to an emergency call during the warranty period. The Contractor shall respond to warranty issues on-site within 24 hours of warranty service call (during normal working hours) unless the Contractor is able to correct the deficiency remotely within 24 hours of that initial warranty service call.

B. All WORK described in this section shall be installed, wired, circuit tested and calibrated by factory trained electricians and mechanics qualified for this WORK. The installing office shall have a minimum of five years of installation experience with the manufacturer and shall provide documentation in submittal package verifying that installation experience. Field installation portion of Section 230926 Work shall not be subcontracted without approval from the Engineer. Field installation subcontractor and installing personnel must have minimum 3 years experience with field controls installation work on projects of similar size and complexity to this project. Provide documentation in submittal package verifying that installation experience. Supervision, calibration and checkout of the system shall be by personnel with documented experience with specified manufacturer.

C. All materials and equipment used shall be standard components, of regular manufacture for this application. All systems and components shall have been thoroughly tested and proven in actual use.

D. The automatic control system shall be installed by trained, qualified personnel and commissioned by factory-trained technicians.

E. Perform work in accordance with NFPA 70.

F. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.3 SYSTEM DESCRIPTION

A. Scope of WORK:

1. This specification describes the primary products and performance of the automatic control system.
2. The Work includes the modification to the existing control system serving the ASU-11 fan system, OR Surgery Suite HVAC system, and the chilled water system.
3. The Work includes all automatic controls work, including electrical and controls, and all other work necessary for a complete operating control system. Line voltage and low voltage wiring necessary for complete installation included hereunder.
4. All wiring shall be installed in conduit. Existing conduit may be re-used where in good condition.
5. The control system shall be designed such that each mechanical system will be able to operate under stand-alone control. In the event of a network failure, or the loss of any other controller, the control system shall continue to operate under independent control.
6. Include installation and calibration, supervision, adjustments, and fine tuning necessary for a complete and fully operational system.
7. Provide supervisory specialists and technicians at the job site to assist in all phases of system installation, startup, balancing, inspection, and commissioning.
8. Provide necessary temporary equipment and connections required in order for occupied areas to remain functional.
9. Provide a comprehensive operator and technician training program as described herein.
10. Provide as-built documentation, operator's terminal software, diagrams, and all other associated project operational documentation including technical manuals, on approved media, the sum total of which accurately represents the final system.
11. Remove all controls no longer utilized with the modified system.
12. Control system design shall meet ASHRAE 135 BACNet communication protocol.

1.4 COORDINATION

A. Equipment: Control Contractor shall supply and install the control equipment. Any control equipment to be installed by others shall be coordinated hereunder. Control Subcontractor shall also coordinate locations of control equipment, including, but not limited to, thermostats, and valve actuators, thermostat bulbs and averaging elements.

B. During the adjustment of the mechanical systems, air and water, the Control Contractor shall provide a trained technician on-site to assist the adjuster with their balancing procedures including any software required to interface with the control sequences. Responsibility for coordination of the times is included under the automatic controls.

C. Control Contractor shall be available throughout start-up of mechanical systems and inspection. Control Contractor shall make adjustments and programming changes as needed during inspection.

1.5 ACCEPTABLE MANUFACTURERS

A. As necessary to integrate into existing Siebe and T.A.C. control system.

1.6 SUBMITTALS

A. Submittal of the entire control system design shall be provided. Submittal shall consist of shop drawings, a complete list of equipment and materials, manufacturer's catalog data sheets, and installation instructions. Terminal identification for all control wiring shall be shown on the shop drawings. Prior to installing the automatic control systems, submit the following for review and approval:

B. Shop Drawings: Control system installation drawings showing the equipment controlled, the locations of field devices, field wiring, layout drawings, riser diagrams, sequence of operation, and bill of materials, in addition to the following:

1. Electrical drawings that show all system internal and external connection points, terminal block layouts, and terminal identification.
2. Indicate trunk cable schematic showing programmable control unit locations, and trunk data conductors.
3. List connected data points, including connected control unit and input device. List all input/output object listings and an alarm point summary listing.
4. Indicate system graphics indicating monitored systems, data (connected and calculated) point addresses, and operator notations.
5. Show system configuration with peripheral devices, batteries, power supplies, diagrams, modems, and interconnections.
6. Indicate description and sequence of operation of operating, user, and application software.
7. Bill of materials for all control equipment and components. Provide valve and damper schedules.
8. Drawings shall detail all control panels, control devices, and all other field devices on building floor plans.
9. Drawings shall be submitted in the following standard sizes: 11” x 17” (ANSI B).

C. Product data/specification sheets for control system components and field devices.

D. BACnet Protocol Implementation Conformance Statement (PICS) for each submitted type of controller and operator interface.

E. Manufacturer's Instructions: Provide and indicate manufacturer's installation instructions for installation, maintenance, and operation of all manufactured components.

F. Project Management: The vendor shall provide a detailed project design and installation schedule with time markings and details for hardware items and software development phases at

the beginning of the project and updated as required. Schedule shall show all phases of the project. Schedule shall show all the target dates for transmission of project information and documents and shall indicate timing and dates for system installation, debugging, and commissioning.

G. Project Record Documents: Record actual locations of control components, including control units, thermostats, and sensors.

1. Revise shop drawings to reflect actual installation and operating sequences.
2. Include submittals data in final "Record Documents" form.
3. Upon completion of the work, provide a complete set of drawings on disk media. Drawings shall be provided as AutoCAD compatible files.

1.7 OPERATION AND MAINTENANCE MANUALS

A. The Operation and maintenance manuals shall be provided to the Owner for approval 10 days prior to the request for Substantial Completion inspection.

B. The operation and maintenance manuals shall include the following information:

1. A user's guide to operate the building management system. The guide shall include the following: log on procedure; viewing system information; viewing and acknowledging alarms; changing a setpoint; printing a trend or report; overriding a point.
2. Manufacturer's data for all control components and maintenance information for all control components requiring periodic maintenance.
3. Complete system “As-Built” control drawings. Complete software “As-Built” diagrams. As-built control drawings and sequences shall be re-submitted as necessary for changes made during commissioning process.

1.8 WARRANTY

A. A warranty period of one year shall commence upon acceptance of the systems by the OWNER. The warranty shall consist of providing parts and labor as required to repair or replace parts of the control system that prove to be faulty due to defective materials or improper installation practices or troubleshooting control sequences that are not operating as specified. Included is reprogramming of the system software to include changes in the point descriptions as requested by the Owner.

B. The Contractor shall respond to warranty issues on-site within 24 hours of warranty service call (during normal working hours) unless the Contractor is able to correct the deficiency remotely within 24 hours of that initial warranty service call.

1.9 MAINTENANCE SERVICE

A. Provide service and maintenance of energy management and control systems for one year from date of approved final completion.

B. Provide complete service of systems, including call backs.

C. Operator workstation software, project software, database, and firmware updates shall be provided to the Owner and installed at no additional charge during this period. Written authorization by Owner must, however, be granted prior to the installation of such changes.

1.10 ACCEPTANCE TESTING

A. Point Verification:

1. All control points shall be tested and included in point-to-point testing report provided to Engineer 1 week prior to inspection. To verify end-to-end operation of the system, the Subcontractor shall provide a hard copy of an All Points Summary Listing to the Owner of each part or system and verify that each point has been successfully tested. Successful testing report must be received prior to being placed in warranty by the Owner. For CHS systems, the Subcontractor shall additionally provide a print screen of the process display showing real time dynamic point information for all points on the subsystem(s) to be accepted.

B. Sequence Verification:

1. The Contractor shall notify the Owner of systems which perform all specified sequences. The Contractor shall provide a report to the Engineer detailing all sequences have been tested and determined to be operating properly prior to inspection. The Engineer shall verify all sequences of operation and place the system into warranty acceptance test.

C. Prepare and start logic control system under provisions of this section.

D. Start-up and commission systems. Allow sufficient time for start-up and commissioning prior to placing control systems in permanent operation.

1. Control system functional tests shall be successfully completed minimum 1 week prior to substantial completion. During this one week period, the Control Contractor shall run trends of the system operation to accumulate data that can be used during the inspection.
2. Control Contractor shall be available on-site during balancing and during equipment start-up.
3. Control Contractor shall be available on-site throughout the substantial completion inspection period.
4. Control system point-to-point check-out shall be successfully completed minimum 1 week prior to substantial completion. Provide point-to-point test summary to Engineer.
5. Immediately following successful completion of inspection, Control Contractor shall provide an on-site technician/programmer for (4) additional hours for additional programming changes directed by Engineer or Project Manager.

1.11 TRAINING

A. After substantial completion and prior to final completion of the installation, facility personnel of Bartlett Regional Hospital shall be instructed on site in the sequence of operation and maintenance of the system hardware and software by the Contractor's qualified representative. A minimum 4 hours of training is to be provided specific to the changes made to the existing control system.

B. Contractor shall provide training syllabus and proposed training dates to Owner for review and approval.

C. Provide application engineer to instruct owner in operation of systems and equipment. Application Engineer trainer shall have been working on project throughout installation and have extensive knowledge of the job specific control system installed and of the control system programming.

PART 2 - PRODUCTS

2.1 BUILDING AUTOMATION SYSTEM (BAS) COMMUNICATIONS

A. Control products, communication media, connectors, repeaters, hubs, and routers shall comprise a BACnet internetwork. Controller and operator interface communication shall conform to ANSI/ASHRAE Standard 135, BACnet.

B. Communication. Controllers shall communicate using BACnet protocol.

C. Internetwork operator interface and value passing shall be transparent to internetwork architecture.

1. An operator interface connected to a controller shall allow the operator to interface with each internetwork controller as if directly connected. Controller information such as data, status, and control algorithms shall be viewable and editable from each internetwork controller.
2. Inputs, outputs, and control variables used to integrate control strategies across multiple controllers shall be readable by each controller on the internetwork. An authorized operator shall be able to edit cross-controller links by typing a standard object address or by using a point-and-click interface.

D. Workstations, Building Control Panels, and Controllers with real-time clocks shall use the BACnet Time Synchronization service. System shall automatically synchronize system clocks daily from an operator-designated device via the internetwork. The system shall automatically adjust for daylight saving and standard time as applicable.

E. Standard BACNet object types accessed by the workstation shall include as a minimum: Analog Value, Analog Input, Analog Output, Binary Value, Binary Input, Binary Output, Calendar, Device, Event Enrollment, File, Notification Class, Program and Schedule object types. All

proprietary object types, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

2.2 FACILITY MANAGEMENT SYSTEM HOST STATION SOFTWARE (CHS)

A. Existing graphics program shall be modified for the new work.

B. Dynamic Graphics: Provide a diagram of each piece of equipment similar to the schematic diagrams shown on the drawings. Display all monitored points, setpoints, control points, schedules, and alarms. Setpoints and schedules shall be adjustable from the equipment diagram.

2.3 MECHANICAL SYSTEMS CONTROLLERS (MSDCs)

A. General:

1. Controls shall be microprocessor based, Air Handler Digital Controllers (AHDC's). AHDC's shall be provided for Air Handling Units, Fans, and Pump control, and other applications as shown on the drawings. AHDC's shall be based on a minimum 16 bit microprocessor working from software program memory which is physically located in the AHDC. The application control program shall be resident within the same enclosure as the input/output circuitry which translates the sensor signals. All input/output signal conversion shall be performed through a minimum of a 10 bit A to D converter. All input points shall be universal in nature allowing their individual function definition to be assigned through the application software. All unused input points must be available as universally definable at the discretion of the owner. If the input points are not fully universal in nature, unused points must be equal in quantity between Analog Inputs and Digital Inputs.
2. The BAS Subcontractor shall provide and field install all AHDC's specified under this section.
3. All input/output signals shall be directly hardwired to the AHDC. Troubleshooting of input/output signals shall be easily executed with a volt-ohm meter (VOM). As a result of this intent, it is specified that power line carrier systems, or other systems which command multiple outputs over a single pair of wires, shall not be utilized.
4. AHDC's shall be in continuous direct communication with the network which forms the facility wide Building Automation System. The AHDCs shall communicate with the SDC at a baud rate of not less than 19,200 baud.

B. Non-Volatile Memory:

1. All control sequences programmed into the AHDC shall be stored in non-volatile memory, which is not dependent upon the presence of a battery, to be retained. Power failures shall not cause the AHDC memory to be lost, nor shall there be any need for batteries to be recharged or replaced to maintain the integrity of the controller database. The AHDC shall allow for the creation of unique application control sequences. Systems that only allow selection of sequences from a library or table, are not acceptable.
2. All control sequences shall be fully programmable at the AHDC, allowing for the creation and editing of an application control sequence, while at the unit.

C. Trending:

1. The AHDC shall provide an input/output point trending utility that is capable of accumulating 48 analog point samples and 10 digital point samples, per input/output point. Each sample shall be taken on a user defined interval, ranging from 1 second to 255 hours per sample. The digital readings shall be on a change of state occurrence for the digital points. All samples shall be recorded with the engineering units for the value, along with a time and date identifier for each sample taken. The samples shall be protected against loss due to power interruptions through a battery or capacitor backup method for a minimum of 30 days.
2. Systems unable to provide the above capability shall provide for the individual input/output point trending at the SDC. Specifics as to how each AHDC point will be trended, at the SDC, shall be provided in the submittal documents. Included in the explanation shall be the sample intervals, the memory allocation in the SDC and the number of AHDC's per SDC that can be expected.

D. Diagnostics:

1. The AHDC shall provide LED indication of transmit/receive communications performance, as well as for the proper/improper operation of the controller itself.

E. Controller Location:

1. To simplify controls and mechanical service troubleshooting, the AHDC shall be mounted adjacent to the air handling system. The AHDC shall be provided in a NEMA approved enclosure. The AHDC shall be constructed in a modular orientation such that service of the failed components can be done quickly and easily. The modular construction should limit the quantities of printed circuit boards to a maximum of two. All logic, control system, power supply and input/output circuitry shall be contained on a single plug-in circuit board. When required to replace a printed circuit board, it shall not be necessary to disconnect any field wiring. This shall allow all controls maintenance and troubleshooting to be made while at the air handling unit. The AHDC shall be directly wired to sensory devices, staging relays or modulating valves for heating and cooling.
2. For compatibility to the environment of the air handling unit, AHDC's shall have wide ambient ratings. AHDC's shall be rated for service from -40 Degree F (Degrees Fahrenheit) to 140 Degree F.

2.4 EQUIPMENT - GENERAL

A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

2.5 CONTROL PANELS

A. Unitized cabinet type for each system under automatic control with relays and controls mounted in cabinet and temperature indicators, pressure gages, pilot lights, push buttons and switches flush on cabinet panel face.

B. NEMA 250, general purpose utility enclosures with enameled finished face panel.

C. Provide common keying for all panels.

2.6 SENSING AND CONTROL OUTPUT REQUIREMENTS

A. Sensing: All sensing inputs shall be provided via industry standard signals. Temperature, humidity, differential pressure signals, and other signal inputs shall be one of the following types: 0-20 mA; 4-20 mA; 0-5 VDC; 0-12 VDC; 1000 ohm platinum (at O C, 2.62 ohms/ºC); 1000 ohm Balco (2.2 ohms/ºF); 10 k ohm Thermistor (at 25ºC/77ºF). All signal inputs shall be compatible with the controllers used and with the requirements for readout of variables in true scaled engineering units as specified.

B. Control Outputs:

1. The control panel shall internally provide test points for the circuits for the purpose of troubleshooting the 120 VAC circuit. All such relays shall be of modular construction that can be easily and quickly replaced on an individual basis if the module were to be damaged.
2. Modulating outputs shall be industry standard 0-5 VDC, or 0-12 VDC with definable output spans to adapt to industry available control products. Milliamp outputs of 0-20 mA or 4-20 mA are also acceptable.

2.7 SENSORS

A. General:

1. Provide sensors with specified output type for remote sensing of temperature, humidity, pressure, and flow rate. Suitable for medium where used, system conditions, and ambient temperature.

B. Duct Air Temperature, Probe Type: For supply air, return air, and exhaust air.

1. With separable, perforated bulb guard. Thermistor or RTD with minimum 32-150 F range, accuracy of +/-0.4 F over full range, and maximum drift of 0.1F/year.

C. Duct Air Temperature, Averaging Type: For mixed air and low limit temperature sensor.

1. Provide averaging bulb thermostats with element installed to cover twice the cross-section of the duct, typically a minimum of 20 feet. Remote bulb or bimetallic rod and

tube type, proportional action with adjustable setpoint in middle of range and adjustable throttling range

2. RTD continuous sensing element with appropriate range, accuracy of +/- 0.75 F over full range, and maximum drift of 0.1 F/year.

D. Low Temperature Limit Switch: 4-wire, two SPDT switches, main contacts open on temperature below setpoint, pilot contacts close. Auto-reset unless otherwise indicated. Extended length capillary type element with any one foot at setpoint causing trip. Freeze protection low limit minimum range 0-60ºF. Suitable for ambient temperatures -40 to 140ºF.

E. Fluid Temperature:

1. Remote bulb or bimetallic rod and tube type, proportional action with adjustable setpoint and adjustable throttling range. Thermistor or RTD with minimum 30-230 F range, accuracy of +/-1.0 F over full range, and maximum drift of 1F per year. Provide appropriate thermal well for the pressure application to allow removal of the sensing element without draining the system. Wells filled with heat conductive compound.

F. Outside Air Temperature:

1. Platinum RTD with minimum -58-110 F range, Accuracy of +/-1.0 F over full range, and maximum drift of 1F per year. Provide sunshield and weatherproof box for exterior location as required.

G. Fluid Pressure:

1. Semi-conductor strain gauge pressure transducer with range 150% of operating pressure and over pressure tolerance of 200% of range pressure, +/-2% accuracy over full range, and maximum drift of 1% full range per year.
2. Provide with brass or stainless steel snubber and pigtail on steam applications.
3. Coordinate tap requirements with the mechanical contractor. Provide with gate or ball valve isolation.

H. Static Pressure Sensors:

1. Unidirectional Semi-conductor strain gauge pressure transducer with ranges not exceeding 150 percent of maximum expected input.
2. Temperature compensate with typical thermal error or 0.06 percent of full scale in temperature range of 40 to 100 degrees F.
3. Accuracy: One percent of full scale with repeatability 0.3 percent.
4. Output: 0 - 5 vdc with power at 12 to 28 vdc.

I. Air Differential Pressure:

1. Semi-conductor strain gauge pressure transducer with range 150% of operating pressure and over pressure tolerance of 200% of range pressure, +/-2% accuracy over full range, and maximum drift of 1% full range per year.
2. Provide static pressure tips with integral compression fittings for reference tubing at duct penetrations.

J. Equipment Operation Sensors:

1. Status Inputs for Fans: Differential pressure switch with adjustable range of 0 to 5 inches wg.
2. Status Inputs for Electric Motors: Current sensing relay with current transformers, adjustable and set to 175 percent of rated motor current.
3. Current Sensing Switches: Current operated solid state switch with adjustable set-point from 1 to 135 amps. Power and status LED's, non-polarity sensitive.
4. Status Inputs for Pumps: Differential pressure switch piped across pump with adjustable pressure differential range.

K. Damper Position Indication: Potentiometer mounted in enclosure with adjustable crank arm assembly connected to damper to transmit 0 - 100 percent damper travel.

L. Humidity Sensors:

1. Elements: Accurate within 2 percent full range with linear output. Two wire sensor.
2. Duct Sensors: With element guard and mounting plate, range of 0 - 100 percent relative humidity.

2.8 SWITCHES

A. Differential Pressure Switch - Liquid: Brass bellows operated single pole double throw switch. Where differential pressure is 10 PSI or less provide United Electric J21K Series or equal. Where differential pressure is greater than 10 PSI provide Penn P-74FA-5 or equal. Provide with gate or ball valve isolation.

B. Current Sensing Switches:

1. Current operated solid state switch, 0.5 to 200 amp amperage range. Mini solid-core or split-core for fixed loads. Veris H-800 series or equal.
2. Current operated solid state switch with adjustable set-point from 1 to 135 amps. Power and status LED's, non-polarity sensitive. For detecting belt loss and motor failure. Veris H-708 solid-core, H-908 split-core or equal.

2.9 CONTROL VALVES

A. Automatic Valves: For water or steam, as applicable, suitable for system conditions. 2-inch and smaller: Brass body, threaded, installed with union on each connection. 2-1/2 inch and larger: Iron body, flanged. Seats and discs or plugs of nonferrous metals. Modulating or positive acting as required. See Contract Documents for operation and capacity.

B. Positive-acting: Flat, single discs with renewable composition faces.

C. Modulating: Single or balanced, parabolic or V-notched inner valve plug. Steam valves single seat type for tight shutoff.

D. General: For chilled water as applicable.

1. Non-terminal unit control valves (1/2" through 3") sizes shall have cast bronze bodies with static pressure rating conforming to ANSI B16.15- 1971 250 PSIG rating. Maximum water pressure shall be 400 PSIG with 40 to 150ºF water, decreasing to 321 PSIG at the maximum water temperature of 281ºF.
2. All valves shall have stainless-steel stems, brass or stainless-steel throttling plugs, bronze valve seats, and spring-loaded Teflon -cone packing.
3. All valves shall be fully modulating unless otherwise indicated. Control Subcontractor is responsible for the selection of the proper control valves for the project including sizing, pressure rating, flow coefficient, flow characteristic, close-off rating, and actuator selection. See schedules for required design pressure drop.
4. All two-way valves shall have contoured or characterized throttling plugs with linear (for steam applications) or equal- percentage flow characteristics.
5. All three-way and four-way valves shall have brass or stainless steel linear throttling plugs with stainless steel stems.

2.10 VALVE ACTUATORS

A. General:

1. Where exposed to outdoor air or air temperatures lower than 50ºF, provide completely weatherproof actuators with internal heaters to allow normal operation at -50ºF. The valve actuator shall be capable of providing the minimum torque required for proper valve close off for the required application.

B. Modulating Electronic Actuators: Self contained, linear motorized actuator with approximately 3/4 inch stroke, 60 second full travel with transformer and SPDT contacts: 24 v DC, 6 watt maximum input.

C. Two-Position Electronic Actuators: Synchronous motor with enclosed gear train, dual return springs, valve position indicator; 2-10v DC, 4-20ma. Valves shall spring return to normal position for temperature protection.

2.11 WIRING

A. Includes all control wiring to complete the system and provide control arrangements specified or shown on the drawings. Power or interlock wiring shall be run in separate conduits from sensor and communications wiring.

1. Low-voltage Control Wiring (12-24v): All wiring shall be enclosed in conduit. Motor disconnect switch shall also disconnect control circuit. Indicating lights wired from the motor terminals or from the last controlling device to the motor to show actual operation. All low voltage control wiring 18 AWG minimum.
2. 110-volt and larger Control Wiring: All NEC Class 1 (line voltage) wiring shall be UL listed in approved raceway according to NEC requirements.
3. All wiring shall be installed in conduit. Existing conduit may be re-used where in good condition.

B. Control Power: Provide 120 volt power connection, transformers, and control power as needed.

Provide the electrical connection between all automatic control equipment and the control power J-boxes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify conditions before starting work.

B. Verify that systems are ready to receive work.

C. Sequence work to ensure installation of components is complementary to installation of similar components in other systems.

D. Coordinate installation of system components with installation of mechanical systems equipment such as chillers, pumps, and other HVAC equipment.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Check and verify location of thermostats and humidistats with plans and room details before installation.

C. Mount freeze protection thermostats using flanges and element holders.

D. Mount outdoor reset thermostats and outdoor sensors indoors, with sensing elements outdoors with sun shield.

E. Provide separable sockets for liquids and flanges for air bulb elements.

F. Provide stainless steel thermowells suitable for respective application and for installation under other sections-sized to suit pipe diameter without restricting flow.

G. Mount control panels adjacent to associated equipment on vibration free walls or free standing angle iron supports. One cabinet may accommodate more than one system in same equipment room. Provide engraved plastic nameplates for instruments and controls inside cabinet and engraved plastic nameplates on cabinet face.

3.3 WIRING AND RACEWAYS

A. General:

1. Provide wiring, conduits and raceway complying with the National Electrical Code, and State and Local Codes and Ordinances.
2. All wiring/cabling shall be installed in conduit.
3. Existing conduit may be used for new wiring if conduit is in good condition.

4. Provide wire with copper stranded conductors. Provide color or number coded jackets.
5. Provide 20 gauge minimum foil-shielded cable rated 100 VDC at 80 C. for input/output wiring.
6. Provide communications network wiring meeting the gauge, impedance, capacitance, resistance and shielding requirements specified by the manufacturer of the connected devices.
7. Install wiring in a neat and orderly manner generally running piping and wiring along building lines.
8. Wire all electrical controls and switches furnished under this section of the Specifications.

3.4 COORDINATION

A. Coordinate this WORK with the WORK of other trades, and make arrangements for the complete and proper accomplishment of all related WORK. Coordinate required control interlocks with HVAC manufacturers or local representatives as necessary.

B. Responsibility for correct operation of air handling units, chillers, pumps, humidifiers, and hydronic system operation included hereunder.

3.5 TESTING AND ADJUSTING

A. Upon completion of the control installation, start up the system, perform necessary testing, and adjust the system to ensure proper operation.

B. Coordinate the final adjustments and “fine tuning” of control functions and devices so the mechanical systems and the control systems operate and respond as an integrated comfortable and energy efficient component of this facility.

C. See PART 1 for additional information.

3.6 ACCEPTANCE TESTING

A. Point Verification:

1. To verify end-to-end operation of the system, the controls contractor shall provide a hard copy of an All Points Summary Listing to the Owner of each part or system to be placed in warranty by the Owner.

B. Sequence Verification:

1. The Contractor shall notify the Owner of systems which perform all specified sequences. The Engineer shall verify all sequences of operation and place the system into warranty acceptance test.

3.7 SEQUENCE OF OPERATIONS

A. CIRCULATION PUMP (CWP-4): Provide new controls for the CWP-4 pump and integrate into existing graphics system.

Magnetic starter with three position switch. In AUTO position pump to operate according to ASU-11 cooling requirements. When the magnetic starter is in the HAND position, pump to operate continuously.

1. Enable CWP-4 when ASU-11 chilled water cooling is required. Pump to operate prior to enabling of water cooled chiller, WWCU-1.
2. Alarm generated when pump does not operate when enabled.
3. Graphics: Indicate chilled water temperatures, pump operation status, and alarms.

B. AIR SUPPLY UNIT ASU-11 (SURGERY): Existing ASU-11 control and graphics shall be modified per the following -

1. Modulating outdoor air, return air, and exhaust air damper control: Modify existing modulating damper control for the following:

Currently, the modulating outdoor air and exhaust air dampers open (and return air damper closes) as needed to provide natural cooling when required to maintain OR supply air temperature reset setpoint. In addition to existing supply air reset control based off of highest OR room temperature, the modulating damper control shall be overridden to close the modulating type outdoor air and exhaust air dampers (and open the return air damper) when the outdoor air dew point temperature is higher than the return air dew point temperature. The modulating outdoor and exhaust air dampers should only be open when the outdoor air dew point temperature is lower than the return air dew point temperature. Existing minimum outdoor air damper and minimum exhaust air damper control (Open position when ASU-11 operates) provide required outdoor air for Surgery area.

2. ASU-11 Humidity Control: Modify existing supply air temperature control for the following:

In addition to existing supply air temperature reset setpoint control based off of highest OR room temperature, the cooling coil 3-way automatic valve shall open to provide cooling (and resulting dehumidification) as needed to maintain the humidity level in each OR suite. When OR room humidity level is above the room RH setpoint, the ASU-11 supply air temperature value used to control the cooling coil AV shall be lowered below that required for room temperature control in order to maintain OR room humidity.

Where cooling coil leaving air temperature required for necessary ASU-11 dehumidification is too low (below an adjustable 50F), the steam coil shall modulate open slowly to reheat the dehumidified air to the minimum Supply Air Temperaure indicated above.

3. AHU-11 Graphics: Add ASU-11 humidity control points, outdoor air and return air relative humidity values, outdoor air and return air temperatures and dew point values, and setpoints to the existing graphics for ASU-11.

C. HUMIDIFIERS (HU-1 to HU-4) for OR-1, OR-2, OR-3, and Surgery support spaces: Existing steam humidifier control and graphics shall be modified per the following -

1. Existing duct steam humidifiers shall be replaced with new. Install steam valve electric actuator. Verify existing control sequence below.

   Duct steam humidifier valve shall modulate open as needed to maintain room humidity setpoint. Supply air humidity shall be limited to 75% maximum per existing duct humidity sensor. Existing high limit humidistat set at 90%.

D. WATER COOLED CHILLER (WWCU-1): Provide new controls for the chiller and integrate into existing graphics system.

1. Water Cooled Chiller (WWCU-1): BAS system shall enable chiller when chilled water cooling is required for ASU-11. Chiller shall be enabled for minimum of 5 minutes and shall remain off for minimum of 10 minutes to minimize cycling. Pump CWP-4 shall operate prior to enabling of chiller unit. Coordinate closely with manufacturer during submittal and procurement process so that chiller internal controls are provided as needed to work integrally with DDC system.
2. Evaporator Outlet Temperature Setpoint: Chiller staging to maintain chilled water supply temperature through BAS output signal. BAS shall provide remote chilled water setpoint. Chilled water setpoint initially set at 30F. Internal chiller controls shall modulate condenser 2-way valve as needed to maintain head pressure during low load periods.
3. Flow Sensors in the evaporator and condenser piping shall not allow chiller to operate without flow (condenser or evaporator).
4. BACNet connection shall be provided for monitoring of chiller.
5. Provide sensors for BAS monitoring of evaporator and condenser supply and return temperatures as shown on Control Drawings.
6. Chiller Graphics: Indicate evaporator chilled water inlet and outlet temperatures, condenser inlet and outlet temperatures, chiller status and alarms, and chilled water temperature setpoint.

E. ADDITIONAL SYSTEMS AND MONITORING POINTS: See Control Drawing M4.1 for additional points required.

END OF SECTION 23 0926

SECTION 232113 - HYDRONIC PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hydronic system requirements.

B. Chilled water piping.

C. Equipment drains and overflows.

D. Pipe hangers and supports.

E. Unions, flanges, mechanical couplings, and dielectric connections.

F. Valves:

1. Gate valves.
2. Ball valves.
3. Check valves.

1.2 RELATED REQUIREMENTS

A. Section 23 0553 - Identification for HVAC Piping and Equipment.

B. Section 23 0719 - HVAC Piping Insulation.

C. Section 23 2114 - Hydronic Specialties.

D. Section 23 2500 - HVAC Water Treatment.

1.3 REFERENCE STANDARDS

A. ASME (BPV IX) - Boiler and Pressure Vessel Code, Section IX - Welding and Brazing Qualifications; The American Society of Mechanical Engineers; 2013.

B. ASME B31.9 - Building Services Piping; 2011 (ANSI/ASME B31.9).

C. ASTM F1476 - Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications; 2007.

D. ASTM A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

E. ASTM A234 - Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.

F. MSS SP-58 - Pipe Hangers and Supports - Materials, Design and Manufacture, Selection, Application, and Installation; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2009.

G. MSS SP69 (Manufacturers Standardization Society of the Valve and Fittings Industry) - Pipe Hangers and Supports - Selection and Application.

H. MSS SP89 (Manufacturers Standardization Society of the Valve and Fittings Industry) - Pipe Hangers and Supports - Fabrication and Installation Practices.

1.4 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. Product Data:

1. Include data on pipe materials, pipe fittings, valves, and accessories.
2. Provide manufacturers catalogue information.
3. Indicate valve data and ratings.

C. Manufacturer's Installation Instructions: Indicate hanging and support methods, joining procedures.

D. Project Record Documents: Record actual locations of valves.

E. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Valve Repacking Kits: One for each type and size of valve.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with minimum three years of experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary protective coating on cast iron and steel valves.

C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.1 HYDRONIC SYSTEM REQUIREMENTS

A. Comply with ASME B31.9 and applicable federal, state, and local regulations.

B. Piping: Provide piping, fittings, hangers and supports as required, as indicated, and as follows:

1. Where more than one piping system material is specified, provide joining fittings that are compatible with piping materials and ensure that the integrity of the system is not jeopardized.
2. Use non-conducting dielectric connections whenever jointing dissimilar metals.
3. Grooved mechanical joints may be used in accessible locations only.

    a. Accessible locations include those exposed on interior of building, in pipe chases, and in mechanical rooms, aboveground outdoors, and as approved by Architect.
    b. Use rigid joints unless otherwise indicated.

4. Provide pipe hangers and supports in accordance with ASME B31.9 unless indicated otherwise.
5. Piping shall be black steel.

C. Pipe-to-Valve and Pipe-to-Equipment Connections: Use flanges, unions, or grooved couplings to allow disconnection of components for servicing; do not use direct welded, soldered, or threaded connections.

D. Valves: Provide valves where indicated:

1. Provide drain valves where indicated, and if not indicated provide at least at main shut-off, low points of piping, bases of vertical risers, and at equipment. Use 3/4 inch (20 mm) gate valves with cap; pipe to nearest floor drain.
2. For throttling, bypass, or manual flow control services, use globe or ball valves.
3. For shut-off and to isolate parts of systems or vertical risers, use gate or ball valves.

E. Welding Materials and Procedures: Conform to ASME (BPV IX).

2.2 CHILLED WATER PIPING (LCWS, LCWR, CWS, CWR)

A. Steel Pipe: ASTM A53/A53M, Schedule 40, black:

1. Threaded Joints: ASME B16.3, malleable iron fittings.

2. Grooved Joints: AWWA C606 grooved pipe with mechanical couplings. Rolled groove joint fasteners to be heavy duty malleable iron flexible mechanical type with sealed

gaskets. Painted with rust preventative paint. Not for piping at cooling coil (piping at coil shall be threaded).

2.3 EQUIPMENT DRAINS AND OVERFLOWS

A. Steel Pipe: ASTM A53/A53M, Schedule 40, black:

1. Threaded Joints: ASME B16.3, malleable iron fittings.

2.4 PIPE HANGERS AND SUPPORTS

A. Provide hangers and supports that comply with MSS SP-58.

1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.

B. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron, adjustable swivel, split ring.

C. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.

D. Vertical Support: Steel riser clamp.

E. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded. Cadmium or zinc plated.

F. Existing Roof Supports: Re-use existing roof support system. Attach additional channel framing to existing supports as required for new piping. Exterior supports shall be galvanized steel. Coordinate on-site with existing roof piping support system. Touch up roof supports with spray applied cold galvanizing.

G. Roof Supports: For use only where new piping cannot be installed on existing roof support system.

1. Manufacturer:

a. CADDY PYRAMID ST Series
b. Eberl RTS roof support system.

2. Description: Piping support system designed for mounting on roof without penetrating existing roof membrane or damaging roofing materials. Fixed and adjustable pipe supports.

3. Base Material: Rubber base with urethane binding material –or- thermoplastic foam base. Minimum 400 lb capacity per individual base support. Steel support factory secured to base. Rated for -50F to 150F.

4. Steel Support: Hot dipped galvanized steel (ASTM A123) channel framing support system. Galvanized steel threaded rod and hangers/guides for piping support and mounting.

5. Installation: Spacing and loading per manufacturer's requirements. Install per manufacturer's instructions.

2.5 UNIONS, FLANGES, MECHANICAL COUPLINGS, AND DIELECTRIC CONNECTIONS

A. Unions for Pipe 2 Inches and Under:

1. Ferrous Piping: 150 psig malleable iron, threaded.

B. Flanges for Pipe Over 2 Inches:

1. Ferrous Piping: 150 psig forged steel, slip-on.
2. Gaskets: 1/16 inch thick. Suitable for fluid type and temperature.

C. Mechanical Couplings for Grooved and Shouldered Joints: Two or more curved housing segments with continuous key to engage pipe groove, circular C-profile gasket, and bolts to secure and compress gasket. Couplings to fully encircle pipe and not U-bolt type. Gaskets suitable for exterior temperatures to -10F and for propylene glycol fluids.

1. Dimensions and Testing: In accordance with AWWA C606.
2. Housing Material: Malleable iron or ductile iron, galvanized.
3. Bolts and Nuts: Hot dipped galvanized or zinc-electroplated steel.
4. When pipe is field grooved, provide coupling manufacturer's grooving tools.

D. Dielectric Connections: Union or waterway fitting with water impervious isolation barrier and one galvanized or plated steel end and one copper tube end, end types to match pipe joint types used.

E. Dielectric Connections: Union thermoplastic-lined steel construction, water impervious isolation barrier, end types to match pipe joint types used. IAMPO/UPC Listed.

2.6 BALL VALVES

A. Manufacturers:

1. Conbraco Industries.
2. Milwaukee Valve Company.
3. Nibco, Inc.
4. Tyco Flow Control.

B. Up To and Including 3 Inches:

1. Bronze two piece body, chrome plated brass ball, full port, teflon seats and stuffing box ring, blow out proof stem, lever handle threaded ends. 1 inch and smaller may have soldered ends. 15% or less zinc content.

2.7 GATE VALVES

A. Manufacturers:

1. Tyco Flow Control
2. Conbraco Industries
3. Nibco, Inc
4. Milwaukee Valve Company

B. Up To and Including 2 Inches:

1. Bronze body, bronze trim, hand wheel, inside screw, solid wedge disc, threaded ends. 1 inch and smaller valves may have soldered ends. 15% or less zinc content.

C. Over 2 Inches:

1. Iron body, bronze trim, bolted bonnet, rising stem, handwheel, outside screw and yoke, solid wedge disc with bronze seat rings, flanged ends.

2.8 GLOBE OR ANGLE VALVES

A. Manufacturers:

1. Tyco Flow Control
2. Conbraco Industries
3. Nibco, Inc
4. Milwaukee Valve Company

B. Up To and Including 2 Inches:

1. Bronze body, bronze trim, screwed bonnet, rising stem and handwheel, inside screw with backseating stem, renewable composition disc and bronze seat, solder ends.

C. Over 2 Inches:

1. Iron body, bronze trim, bolted bonnet, rising stem, handwheel, outside screw and yoke, rotating plug-type disc with renewable seat ring and disc, flanged ends.

2.9 SWING CHECK VALVES

A. Manufacturers:

1. Hammond Valve.
2. Nibco, Inc.
3. Milwaukee Valve Company.

B. Up To and Including 2 Inches:

1. Bronze body, bronze trim, bronze rotating swing disc, with composition disc, threaded ends. 1 inch and smaller may have soldered ends.

C. Over 2-1/2 Inches and larger:

1. Iron body, bronze trim, bronze or bronze faced rotating swing disc, renewable disc and seat, flanged ends.

2.10 SPRING LOADED CHECK VALVES

A. Manufacturers:

1. Hammond Valve.
2. Crane Co.
3. Milwaukee Valve Company.

B. Class 125, iron body, bronze trim, stainless steel springs, bronze disc, Buna N seals, wafer style ends.

C. Up To and Including 2 inches: Class 125, bronze body. Stainless steel stem and 316 Stainless steel spring with rubber seat, threaded ends. 1" diameter and smaller valves may have soldered ends.

D. Over 2 Inches:

1. Class 125, iron body silent check, bronze trim, stainless steel springs, bronze disc, Buna N seals, flanged ends.

E. Use spring type check valves on pump discharge.

2.11 FLEXIBLE CONNECTIONS

A. Manufacturers:

1. Metraflex Company

B. Inner Hose: Carbon Steel.

C. Exterior Sleeve: Single braided, stainless steel.

D. Pressure Rating: 125 psi and 450 degrees F.

E. Joint: Flanged.

F. Size: Use pipe sized units.

G. Maximum offset: 3/4 inch on each side of installed center line.

PART 3 EXECUTION

3.1 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Prepare pipe for grooved mechanical joints as required by coupling manufacturer.

C. Remove scale and dirt on inside and outside before assembly.

D. Prepare piping connections to equipment using jointing system specified.

E. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

F. After completion, fill, clean, and treat systems. Refer to Section 23 2500 for additional requirements.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install chilled water piping to ASME B31.9 requirements.

C. Pipe Hangers and Supports:

1. Install in accordance with ASME B31.9.
2. Support horizontal piping as scheduled.
3. Install hangers to provide minimum 1/2 inch (13 mm) space between finished covering and adjacent work.
4. Place hangers within 12 inches (300 mm) of each horizontal elbow.
5. Use hangers with 1-1/2 inch (38 mm) minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
6. All hangers are to be installed on the outside of the insulated piping.
7. Install exterior piping on existing steel roof support system unless noted otherwise.
8. Where new roof piping support system is required, use roof support system that does not damage existing roof membrane. Similar to CADDY PYRAMID ST series or RTS Roof Support System. Install per manufacturer’s requirements.

D. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.

E. Install valves with stems upright or horizontal, not inverted.

F. Piping Tests: All piping tested hydrostatically at 125 psi for minimum of four hours. System shall remain tight for test period without leaks, displacement, or straining. Equipment, gages, and thermometer wells rated for a lesser pressure suitably protected during tests. Leaks developed during tests shall be corrected without caulking and test restarted until a perfectly

tight system is obtained. Enclosed piping tested before concealing. Test performed in presence of Owner.

G. Where more than one piping system material is specified, ensure system components are compatible and joined to ensure the integrity of the system is not jeopardized. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

H. Use unions, flanges, and couplings downstream of valves and at equipment or apparatus connections. Do not use direct welded or threaded connections to valves, equipment or other apparatus. Flanged gasket material shall meet or exceed temperature and pressure rating of system.

I. Branch piping connected to sides of mains. Connections off of top or bottom not permitted. When approved by the Engineer, branch piping may be connected to side of mains at a 45 degree angle when limited by space.

J. Where piping penetrates wall, run insulation through penetration. Seal penetration watertight. Seal opening through EIFS exterior wall system with backer rod and sealant. Interior of wall shall be insulated around piping and air sealed. Any new penetrations through exterior wall shall be cleanly cut round holes.

K. Route piping in orderly manner, parallel to building structure, and maintain gradient.

L. Install piping to conserve building space and to avoid interfere with use of space.

M. Group piping whenever practical at common elevations.

N. Slope piping and arrange to drain at low points.

3.3 APPLICATION

A. Use grooved mechanical couplings and fasteners only in accessible locations and at connections to equipment.

B. Install unions downstream of valves and at equipment or apparatus connections.

C. Install gate or ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

D. Install globe valves for throttling, bypass, or manual flow control services.

E. Use spring loaded check valves on discharge of pumps.

F. Use 3/4 inch gate valves with cap for drains at main shut-off valves, low points of piping, bases of vertical risers, and at equipment.

G. Use flexible connections for chiller.

3.4 SCHEDULES

A. Hanger Spacing for Steel Pipe.

1. 1/2 inch and 1-1/4 inch: Maximum span, 6 feet; minimum rod size, 3/8 inch.
2. 1-1/2 inch and 2 inch: Maximum span, 8 feet; minimum rod size, 1/2 inch.
3. 2-1/2 inch through 4 inch: Maximum span, 10 feet; minimum rod size, 1/2 inch.
4. Exterior Piping: As required by roof piping support manufacturer. Maximum 8 feet.

END OF SECTION 23 2113

SECTION 232114 - HYDRONIC SPECIALTIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Expansion tanks.

B. Air vents.

C. Air separators.

D. Strainers.

E. Relief valves.

1.2 RELATED REQUIREMENTS

A. Section 23 2113 - Hydronic Piping.

B. Section 23 2500 - HVAC Water Treatment

1.3 REFERENCE STANDARDS

A. ASME (BPV VIII, 1) - Boiler and Pressure Vessel Code, Section VIII, Division 1 - Rules for Construction of Pressure Vessels; The American Society of Mechanical Engineers; 2007.

1.4 SUBMITTALS

A. See Section 01 3300 Submittal Procedures.

B. Product Data: Provide product data for manufactured products and assemblies required for this project. Include component sizes, rough-in requirements, service sizes, and finishes. Include product description, model and dimensions.

C. Manufacturer's Installation Instructions: Indicate hanging and support methods, joining procedures.

D. Project Record Documents: Record actual locations of flow controls.

E. Maintenance Data: Include installation instructions, assembly views, lubrication instructions, and replacement parts list.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary protective coating on cast iron and steel valves.

C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 - PRODUCTS

2.1 EXPANSION TANKS (ET)

A. Manufacturers:

1. Amtrol.
2. Bell & Gossett
3. Taco.

B. ET-3 (Low Temperature Chilled Water): Diaphragm type: Welded steel, tested and stamped in accordance with ASME SEC 8-D; rated for working pressure of 125 psig, with flexible butyl/EPDM diaphragm sealed into tank. Horizontal mounted. Hung from roof structure. Provide seismic bracing. Suitable for proplylene glycol solutions.

C. Accessories: Pressure gage and air-charging fitting.

D. Size: See Schedules.

2.2 AUTOMATIC AIR VENTS

A. Manufacturers:

1. Spirotherm Spirotop

B. Brass body, solid non-metallic float, brass vented head threaded for connection of drain. Viton seal and o-ring. 150 psig working pressure. Automatic air vent suitable for system operating temperature and pressure; with isolating valve.

2.3 MANUAL AIR VENT

A. Manufacturers:

1. Hoffman Model 500.
2. Bell & Gossett Model 17SR.
3. Taco Model 417.
4. Substitutions: Not Permitted.

B. Manual Air Vent; Washer Type: Brass with hydroscopic fiber discs, vent ports, adjustable cap for manual shut-off, and integral spring loaded ball check valve.

2.4 AIR SEPARATORS (AS-1)

A. Manufacturers:

1. Spirotherm - Spirovent VDR

B. Air Separators, Dirt/Water type:

1. Steel construction for 150 psig maximum operating pressure. ASME Section VIII, Division 1. Integrated brass venting mechanism on top. Threaded blowdown connection port at bottom.
2. Inline threaded type with unions each side.
3. Air and dirt eliminator: Copper bundle designed to suppress turbulence and provide high efficiency. Shall be capable of removing 100% of free and entrained air, and 99.6% of the dissolved air. Dirt separation shall be at least 80% of all particles 30 micron and larger within 100 passes.

2.5 STRAINERS

A. Manufacturers:

1. Hoffman.
2. Spiray/Sarco
3. Mueller.

B. Size 2 inch and Under:

1. Screwed brass or iron body for 175 psi working pressure, Y pattern with 1/32 inch stainless steel perforated screen.

C. Size 2-1/2 inch to 4 inch:

1. Flanged iron body for 175 psi working pressure, Y pattern with 3/64 inch stainless steel perforated screen.

2.6 FLOW SETTER VALVES

A. Manufacturers:

1. Armstrong International, Inc.
2. ITT Bell & Gossett.
3. Myson, Inc.

B. Angle or straight pattern, rising stem, inside screw globe valve for 125 psi working pressure, with bronze body and integral union for screwed connections, renewable composition disc, plastic wheel handle for shut-off service, and lockshield key cap and set screw memory bonnet for balancing service.

C. Spare: Provide minimum of two spare caps and one set of probes suitable to test the valve.

2.7 RELIEF VALVES

A. Manufacturers:

1. Armstrong International.
2. ITT Bell & Gossett.
3. Conbraco Industries.
4. Watts

B. Bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labeled.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install specialties in accordance with manufacturer's instructions.

B. Where large air quantities can accumulate, provide enlarged air collection standpipes.

C. Provide manual air vents at system high points and as indicated.

D. Provide air separator on suction side of system circulation pump and connect to expansion tank.

E. Provide valved drain and hose connection on strainer blow down connection.

F. Provide spring loaded check valve on discharge side of centrifugal pumps.

G. Clean and flush glycol piping system before adding glycol solution. Refer to Section 23 2500.

H. Perform tests determining percentage of glycol and water solution and submit written test results.

3.2 MAINTENANCE

A. Explain corrective actions to OWNER's maintenance personnel in person.

B. Clean all strainers immediately after pump start-up. Provide written verification to Project Manager.

END OF SECTION 23 2114

SECTION 232123 – PUMPS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. In-line circulators.

1.2 RELATED REQUIREMENTS

A. Section 23 0719 - HVAC Piping Insulation. Insulation of pump.

B. Section 23 2113 - Hydronic Piping.

C. Section 23 2114 - Hydronic Specialties.

D. Electrical Specifications - Equipment Wiring: Electrical characteristics and wiring connections.

1.3 REFERENCE STANDARDS

A. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; National Electrical Manufacturers Association; 2008.

B. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. UL 778 - Standard for Motor-Operated Water Pumps; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

1.4 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. Product Data: Provide certified pump curves showing performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable. Include electrical characteristics and connection requirements.

C. Manufacturer's Installation Instructions: Indicate hanging and support requirements and recommendations.

D. Operation and Maintenance Data: Include installation instructions, assembly views, lubrication instructions, and replacement parts list.

E. Maintenance Materials: Furnish the following for OWNER's use in maintenance of project.

1. Provide one spare pump for: CWP-4

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacture, assembly, and field performance of pumps, with minimum three years of documented experience.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Grundfos Magna 3

2.2 HVAC PUMPS - GENERAL

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

B. Minimum Quality Standard: UL 778.

C. Products Requiring Electrical Connection: Listed and classified by UL or testing agency acceptable to authority having jurisdiction as suitable for the purpose specified and indicated.

2.3 CHILLED WATER PUMP (CWP-4)

A. Type: Inline, canned-rotor type, maintenance free. Permanent magnet motor. Capable of 230F and 175 psi.

B. Pump housing, motor stool: Cast-iron. Pump housing and pump head shall be electrocoated (epoxy).

C. Impeller: Composite PES. Radial type with curved blades

D. Rotor Can and Cladding: Stainless Steel

E. Shaft: 316L Stainless steel.

F. Controls: Differential pressure and temperature sensors. Pump shall be capable of speed control on motor and 0-10 Vdc signal.

G. Performance:

1. See Schedule on Sheet M0.1.

H. Electrical Characteristics:

1. Refer to Electrical Specifications.
2. See Schedule on Sheet M0.1.
3. Motor shall be permanent magnet motor type.

I. Basis of Design:

1. CWP-4: Grundfos Magna 3 40-180F

PART 3 - EXECUTION

3.1 PREPARATION

A. Verify that electric power is available and of the correct characteristics.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide access space around pumps for service. Provide no less than minimum space recommended by manufacturer.

C. Decrease from line size with long radius reducing elbows or reducers. Support piping adjacent to pump such that no weight is carried on pump casings.

D. Provide line sized shut-off valve and strainer on pump suction, and line sized soft seat spring type check valve and balancing valve on pump discharge.

3.3 FIELD QUALITY CONTROL

A. Lubricate pumps before start-up.

B. Motors: Ensure proper alignment and rotation.

C. Verify power requirements on-site with Control Contractor and Electrical Contractor.

3.4 COORDINATION

A. Coordinate this Work with the Work of other trades, and make arrangements for the complete and proper accomplishment of all related Work. Coordinate required controls with Control Contractor.

3.5 TESTING AND ADJUSTING

A. Upon completion of the installation, start-up the system, perform necessary testing and adjust the system to ensure proper operation.

END OF SECTION 23 2123

SECTION 232213 -STEAM AND STEAM CONDENSATE PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Pipe and pipe fittings.

B. Valves.

C. Steam piping system.

C. Steam condensate piping system.

1.2 RELATED REQUIREMENTS

A. Section 23 0719 - HVAC Piping Insulation.

B. Section 23 2214 - Steam and Steam Condensate Specialties.

1.3 REFERENCE STANDARDS

A. ASME (BPV IX) - Boiler and Pressure Vessel Code, Section IX - Welding and Brazing Qualifications; The American Society of Mechanical Engineers.

B. ASME B16.3 - Malleable Iron Threaded Fittings; The American Society of Mechanical Engineers.

C. ASME B31.1 - Power Piping; The American Society of Mechanical Engineers; (ANSI/ASME B31.1).

D. ASME B31.9 - Building Services Piping; The American Society of Mechanical Engineers; (ANSI/ASME B31.9).

E. ASTM A 53/A 53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless.

F. ASTM A 234/A 234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.

G. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society.

H. MSS SP-58 - Pipe Hangers and Supports - Materials, Design and Manufacture; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.

I. MSS SP-69 - Pipe Hangers and Supports - Selection and Application; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2003.

J. MSS SP-89 - Pipe Hangers and Supports - Fabrication and Installation Practices; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2003.

1.4 SYSTEM DESCRIPTION

A. When more than one piping system material is selected, ensure systems components are compatible and joined to ensure the integrity of the system is not jeopardized. Provide necessary joining fittings. Ensure flanges, unions, and couplings for servicing are consistently provided.

B. Use unions and flanges downstream of valves and at equipment or apparatus connections. Use dielectric unions where joining dissimilar materials. Do not use direct welded or threaded connections.

C. Provide pipe hangers and supports in accordance with ASME B31.9 unless indicated otherwise.

D. Use gate valves for shut-off and to isolate equipment, part of systems, or vertical risers.

E. Use gate valves for throttling, bypass, or manual flow control services.

F. Use globe valves for drain valves and for throttling control.

G. Use ball valves only where specifically noted as acceptable.

1.5 SUBMITTALS

A. See 01 3300 Submittal Procedures.

B. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories. Provide manufacturers catalogue information. Indicate valve data and ratings.

C. Welders Certificate: Include welders certification of compliance with ASME (BPV IX).

D. Manufacturer's Installation Instructions: Indicate hanging and support methods, joining procedures.

E. Project Record Documents: Record actual locations of valves.

F. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Valve Repacking Kits: One for each type and size of valve.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience. Shall be experienced in steam and condensate systems.

B. Installer Qualifications: Company specializing in performing the work of this section, with minimum three years of documented experience. Shall be experienced in steam and condensate systems.

1.7 REGULATORY REQUIREMENTS

A. Conform to ASME B31.9 and ASME B31.1 code for installation of piping system.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.1 LOW PRESSURE STEAM PIPING

A. Steel Pipe: ASTM A 53/A 53M, Schedule 40 or Schedule 80, black.

1. Fittings: ASME B16.3 malleable iron Class 125, or ASTM A 234/A 234M wrought steel.
2. Joints: Threaded.

2.2 LOW PRESSURE STEAM CONDENSATE PIPING

A. Steel Pipe: ASTM A 53/A 53M, Schedule 80, black.

1. Fittings: ASME B16.3 malleable iron Class 125, or ASTM A 234/A 234M wrought steel.
2. Joints: Threaded.

2.3 PIPE HANGERS AND SUPPORTS

A. Conform to ASME B31.9.

B. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron, adjustable swivel, split ring.

C. Hangers for Pipe Sizes 2 to 4 Inches: Carbon steel, adjustable, clevis.

D. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded. Cadmium or zinc plated for corrosion protection.

2.4 UNIONS, FLANGES, AND COUPLINGS

A. Unions for Pipe 3 Inches and Under:

1. Ferrous Piping: 150 psig galvanized malleable iron, threaded.

2.5 GATE VALVES

A. Manufacturers:

1. Nibco, Inc
2. Milwaukee Valve Company
3. Powell
4. Hammond

B. Up To and Including 2- Inches:

1. MSS SP-80, Class 150. Bronze body, bronze trim, screw-in bonnet, non-rising stem, lockshield stem, inside screw with backseating stem, solid wedge disc, alloy seat rings, threaded ends.

2.9 GLOBE VALVES

A. Manufacturers:

1. Nibco, Inc
2. Milwaukee Valve Company
3. Powell
4. Hammond

B. Up To and Including 3 Inches:

1. MSS SP-80, Class 125, bronze body, bronze trim, screw-in bonnet, renewable seat and disc, threaded ends.

C. Use: Only for use at drain valves and for use as a throttling valve.

2.10 BALL VALVES

A. Manufacturers:

1. Nibco, Inc
2. Milwaukee Valve Company
3. Powell
4. Hammond

B. Up To and Including 2 Inches:

1. MSS SP-110, Class 150, 400 psi CWP, bronze, two piece body, chrome plated bronze ball, full port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, threaded ends. Rated for steam.

C. Use: Only where specifically noted.

PART 3 - EXECUTION

3.1 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare piping connections to equipment with flanges or unions.

D. Keep open ends of pipe free from scale and dirt. Whenever work is suspended during construction protect open ends with temporary plugs or caps.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Route piping in orderly manner, plumb and parallel to building structure, and maintain gradient.

C. Install piping to conserve building space and avoid interference with use of space.

D. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

E. Pipe Hangers and Supports:

1. Install in accordance with ASME B31.9.
2. Support horizontal piping as scheduled.

3. Place hangers within 12 inches of each horizontal elbow.
4. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.

F. Provide clearance for installation of insulation and access to valves and fittings.

G. Slope steam condensate piping one inch in 40 feet. Provide drip trap assembly at low points. Provide loop vents over trapped sections.

H. Slope steam piping one inch in 40 feet in direction of flow. Use eccentric reducers to maintain bottom of pipe level.

I. Install valves with stems upright or horizontal, not inverted.

J. Drain valves shall be ¾-inch globe valves with threaded plug.

K. Prime and paint all new exposed metal piping with two coats rust preventive paint - black.

3.3 SCHEDULES

A. Hanger Spacing for Steel Steam Condensate Piping.

1. 1/2 inch, 3/4 inch, and 1 inch diameter: Maximum span, 7 feet; minimum rod size, 3/8 inch.
2. 1-1/4 inches: Maximum span, 8 feet; minimum rod size, 3/8 inch.
3. 1-1/2 inches: Maximum span, 9 feet; minimum rod size, 3/8 inch.
4. 2 inches: Maximum span, 10 feet; minimum rod size, 3/8 inch.

B. Hanger Spacing for Steel Steam Piping.

1. 1/2 inch: Maximum span, 8 feet; minimum rod size, 3/8 inch.
2. 3/4 inch and 1 inch: Maximum span, 9 feet; minimum rod size, 3/8 inch.
3. 1-1/4 inches: Maximum span, 10 feet; minimum rod size, 3/8 inch.
4. 1-1/2 inches: Maximum span, 10 feet; minimum rod size, 3/8 inch.
5. 2 inches: Maximum span, 10 feet; minimum rod size, 3/8 inch.

END OF SECTION 22 2213

SECTION 232214 -STEAM AND STEAM CONDENSATE SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Steam Traps

1.2 RELATED REQUIREMENTS

A. Section 23 0519 – Meters and Gages for HVAC Piping: Pressure gages for steam.

B. Section 23 0719 - HVAC Piping Insulation.

C. Section 23 2213 - Steam and Steam Condensate Piping.

1.3 REFERENCE STANDARDS

A. ASME B31.9 - Building Services Piping; The American Society of Mechanical Engineers (ANSI/ASME B31.9).

B. ASTM A 126 - Standard Specification for Grey Iron Castings for Valves, Flanges, and Pipe Fittings.

C. ASTM A 105 - Standard Specification for Carbon Steel Forgings for Piping Applications.

1.4 SUBMITTALS

A. See 01 3300 for Submittal Procedures.

B. Product Data:

1. Provide for manufactured products and assemblies required for this project.
2. Include product description, model, dimensions, component sizes, rough-in requirements, service sizes, and finishes.
3. Submit schedule indicating manufacturer, model number, size, location, rated capacity, load served, and features for each specialty.

C. Manufacturer's Installation Instructions: Indicate application, selection, and hookup configuration. Include pipe and accessory elevations.

D. Operation and Maintenance Data: Include installation instructions, servicing requirements, and recommended spare parts lists.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Extra Bucket Trap: One for each type and size.

2. Steam Trap Service Kits: One for each type and size.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with State of Alaska standard for installation of boilers and pressure vessels.

1. Maintain one copy of each document on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum three years of documented experience.

C. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.1 STEAM TRAPS

A. Manufacturers:

1. Armstrong International, Inc
2. Hoffman Specialties
3. Spirax-Sarco B1H

B. Steam Trap Applications:

1. Use Bucket Traps for:

a. Steam Humidifiers

C. Steam Trap Performance:

1. Select to handle minimum of two times maximum condensate load of apparatus served. Coordinate with humidifier provided for proper selection.

2. Steam inlet pressure at humidifier: 10 psig.
3. Pressure Differentials:

    a. Low Pressure Systems (15 psi maximum): 1/2 psi minimum differential.

D. Bucket Traps: Steam traps shall be of the mechanical inverted bucket type with cast iron bodies, screwed NPT horizontal connections and stainless steel valve head, seat and bucket. Internal bi-metal air vent and stainless steel strainer screen (20 mesh) shall be provided.

1. Rating: 250 psi rated.
2. Features: Access to internal parts without disturbing piping, bottom drain plug.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install steam and steam condensate piping and specialties in accordance with ASME B31.9.

B. Install specialties in accordance with manufacturer's instructions.

C. After completion, fill, clean, and treat systems.

D. Steam Traps:

1. Replace existing F&T steam traps at humidifiers with bucket type steam traps as recommended by humidifier manufacturer. Coordinate with humidifier supplier.
2. Install with union connections at both ends.
3. Provide gate valve and strainer at inlet, Provide gate valve, test valve and drain, and check valve at discharge.
4. Provide minimum 10 inch long, line size dirt pocket between apparatus and trap.
5. Install minimum 5 feet un-insulated pipe length between dirt leg and trap.

END OF SECTION 22 2214

SECTION 232500 – HVAC WATER TREATMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Cleaning of piping systems.

B. Chemical treatment.

C. Anti-freeze feed system for low temperature chilled water system.

D. Propylene glycol specialties.

E. Anti-freeze system maintenance.

1.2 RELATED REQUIREMENTS

A. Section 23 2113 - Hydronic Piping.

B. Section 23 2114 - Hydronic Specialties.

C. Section 23 0926 – Building Automation System and Automatic.

D. Electrical Specifications - Equipment Wiring: Electrical characteristics and wiring connections.

1.3 SUBMITTALS

A. See Section 01 3300 for Submittal Procedures.

B. Product Data: Provide chemical treatment materials, chemicals, and equipment including electrical characteristics and connection requirements.

C. Manufacturer's Installation Instructions: Indicate placement of equipment in systems, piping configuration, and connection requirements.

D. Project Record Documents: Record actual locations of equipment and piping.

E. Operation and Maintenance Data: Include data on feed pumps and other equipment including spare parts lists, procedures, and treatment programs. Include step by step instructions on test procedures including target concentrations.

F. Maintenance Materials: Furnish the following for OWNER's use in maintenance of project.

1. Sufficient chemicals for treatment and testing during required maintenance period.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing the type of work specified in this section, with minimum three years of experience and approved by manufacturer.

1.5 REGULATORY REQUIREMENTS

A. Conform to applicable code for addition of non-potable chemicals to building mechanical systems and to public sewage systems.

B. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.1 CHEMICAL TREATMENT

A. TriSodium Phosphate (TSP) based product specially formulated for new system start-ups. Designed as a pre-cleaner for anti-freeze applications. Removes greases, oil, rust, scale, flux, pipe joint compound and other residues of manufacture and assembly.

B. Provide volume required for cleaning chilled water piping system prior to start-up of service.

2.2 ANTI-FREEZE MAKEUP SYSTEM (GFT-1) FOR LOW TEMPERATURE CHILLED WATER SYSTEM

A. Manufacturers:
1. Wessels Company GMP-18
2. J. L. Wingert Company.
3. Neptune Chemical Pump Company.

B. Description: Automatic glycol feed package consisting of a prefabricated polyethylene tank, polyethylene cover, 110 volt pressurization pump with integral pressure control, pressure assembly. Pressurization assembly shall consist of a pressurization pump with pressure controls, a pre-pressurized storage tank, a pressure reducing valve, and pressure gage to continuously monitor the PRV outlet controls. Field adjustable pressure. 18 gallon capacity. Preset at 12 psig.

2.3 PROPYLENE GLYCOL SOLUTION

A. Propylene Glycol Anti-freeze:

1. Manufacturers:
   a. Dow Chemical.
   b. Lyondell Chemical.
2. Provide and fill the low temperature chilled water piping system with propylene glycol for a 30% anti-freeze mixture. Store quantity not used in initial fill and steady state operation in storage containers in location directed by Owner.
3. Test Kit. Provide testing kit with floating ball hydrometer, in waterproof case with minimum of five years of materials for semiannual testing.

PART 3 - EXECUTION

3.1 PREPARATION

A. Systems shall be operational, filled, started, and vented prior to cleaning.

B. Place terminal control valves in open position during cleaning.

C. Verify that electric power is available and of the correct characteristics.

3.2 CLEANING SEQUENCE

A. Chilled Water Systems:

1. Clean as indicated in manufacturer’s literature.
2. Circulate for 6 hours, then drain.
3. Refill with clean water and repeat until system cleaner is removed.

B. Use neutralizer agents on recommendation of TSP system cleaner supplier.

C. Remove, clean, and replace strainer screens.

D. Inspect, remove sludge, and flush low points with clean water after cleaning process is completed. Include disassembly of components as required.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Coordinate anti-freeze delivery and installation per manufacturer’s instructions. Provide temporary pumps and containers as needed to transfer and mix antifreeze to concentrations required. Verify concentrations via calculations and testing procedure.

C. Fill system and start-up glycol fill tank per manufactures instructions.

3.4 CLOSEOUT ACTIVITIES

A. Training: Train OWNER's personnel on operation and maintenance of glycol system.

1. Have operation and maintenance data prepared and available for review during training.

END OF SECTION 23 2500

SECTION 233100 - HVAC DUCTS AND ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Metal ductwork.

B. Duct access doors.

C. Volume dampers.

1.2 RELATED REQUIREMENTS

A. Section 23 0593 - Testing, Adjusting, and Balancing for HVAC.

B. Section 23 0713 - Duct Insulation.

1.3 REFERENCE STANDARDS

A. SMACNA (DCS) - HVAC Duct Construction Standards.

B. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

C. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; National Fire Protection Association; 2012.

1.4 SUBMITTALS

A. See Section 01 3300 Submittal Procedures.

B. Product Data: Provide data for duct materials and accessories.

C. Project Record Documents: Record actual locations of volume dampers.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing the type of work specified in this section, with minimum three years of documented experience.

C. All sheet metal workers shall have a minimum documented sheet metal fabrication and installation experience in commercial or industrial facilities of 3 years or be enrolled in an Alaska Department of Labor approved Sheet Metal Apprentice program. The ration on on-site workers shall not exceed 3 apprentices or sheet metal workers for every one foreman. A foreman is defined as a sheet metal worker with a minimum of 3 years experience as detailed above or is an approved Journeyman.

1.6 REGULATORY REQUIREMENTS

A. Construct ductwork to NFPA 90A standards.

1.7 FIELD CONDITIONS

A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.

B. Maintain temperatures within acceptable range during and after installation of duct sealants.

C. Particular care shall be taken in storage and handling of such materials to maintain its clean condition. Provide temporary end caps and closures on ductwork and fittings until ready for immediate use. Maintain in place until installation. Store ductwork and equipment in clean, enclosed from weather, location at all times. Materials are not to be stored in direct contact with dirty surfaces or on dirt floor. If ductwork, equipment, and components are found to be improperly stored they shall be removed from the project immediately and new, clean materials shall be used.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect dampers from damage to operating linkages and blades.

PART 2 PRODUCTS

2.1 DUCT MATERIALS

A. Galvanized Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating. Minimum of 24 gage.

B. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.

1. Type: Heavy mastic or liquid, suitable for joint configuration and compatible with substrates, and recommended by manufacturer for pressure class of ducts.
2. Surface Burning Characteristics: Flame spread of zero, smoke developed of zero, when tested in accordance with ASTM E84.

2.2 DUCTWORK FABRICATION

A. Fabricate and support in accordance with SMACNA HVAC Duct Construction Standards.

B. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

2.3 DUCT SEALANTS

A. Sealant: UL listed vinylacrylic or copolymer based duct sealer. Similar to Durodyne DDS-181, Uni-mastic 181.

2.4 DUCT ACCESS DOORS

A. Manufacturers:

1. Air Balance.
2. Durodyne.
3. Ventlock.
4. Ruskin Company

B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards and as indicated.

C. Fabrication: Galvanized steel. Rigid and close-fitting of reinforced galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ducts, install minimum 1 inch thick insulation with sheet metal cover.

1. Less Than 12 inches Square: Secure with sash locks.
2. Up to 18 inches Square: Provide two small hinges or one continuous hinge and one compression latch.
3. Up to 24 x 48 inches: Three large hinges or one continuous hinge and two compression latches with outside and inside handles.
4. Sash Lock: Similar to Ventlock Model 90.
5. Compression Latch: Similar to Ventlock Model 140, 202, or 310.
6. Hinge: Small hinges to be zinc plated steel, minimum 2 x 1-1/2 inches wide or 1-1/2 inch wide piano hinge. Large hinges to be zinc plated steel, minimum 3 x 2 inches wide or 2 inch wide piano hinge. Similar to Ventlock Model 150, 157 or 167, 250.

D. Access doors with sheet metal screw fasteners are not acceptable.

2.5 DUCT TEST HOLES

A. Temporary Test Holes: Cut or drill in ducts as required. Cap with neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

2.6 VOLUME CONTROL DAMPERS

A. Manufacturers:

1. Ventlock
2. Nailor Industries Inc
3. Ruskin Company
4. Durodyne
5. Rossi

B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.

C. Single Blade Dampers

1. Fabricate for duct sizes up to 6 x 30 inch.
2. Blade: 24 gage, minimum.

D. Multi-Blade Dampers: 14 gage aluminum air foil shaped dampers with vinyl bulb or neoprene edging and flexible metal compression edge seals in 16 gage galvanized steel hat channel frame. Bearings shall be corrosion resistant, permanently lubricated, stainless steel sleeve type. Axles shall be plated steel type positively locked in damper blade. Damper blades positioned across short air opening dimension.

E. End Bearings: Except in round ductwork 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings. Provide closed end bearings on all ducts having a pressure classification over 2 inches wg; Ventlock Model 607 or 609. Similar Durodyne or Young

F. Regulators:

1. Provide self-locking, indicating regulators with heavy steel stamped handle on single and multi-blade dampers.
2. On insulated ducts mount regulators on standoff mounting brackets, bases, or adapters.
3. Where rod lengths exceed 30 inches provide regulator at both ends.
4. Ventlock Model 641. Similar Durodyne or Young.
5. Install ceiling access doors (24x24 minimum) in gyp ceilings where needed to access new dampers.
6. Regulators with wing nuts are not acceptable.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install, support, and seal ducts in accordance with SMACNA HVAC Duct Construction Standards.

B. Install in accordance with manufacturer's instructions.

C. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system. Check frequently that sealing of ducts is intact.

D. Duct and Plenum Sealing:

1. Seal all longitudinal and latitudinal joints of metal ducts with two coats of sealant. Apply sealant in accordance with manufacturer's recommendations. Apply second coat of sealant after first coat has completely cured. Inspect seams with ductwork pressurized and reapply as required for an airtight application.

E. Provide duct test holes where indicated and required for testing and balancing purposes.

F. Provide duct access doors where indicated. Provide minimum 8 x 8 inch size for hand access unless otherwise indicated. Review locations prior to fabrication.

G. Schedule installation of new dampers above surgery area gypboard ceilings to occur at same time as cutting/patching of ceiling. Sheet Metal Contractor shall be responsible for locating gypboard ceiling cutting/patching location for access to supply air and return air ductwork above corridor ceiling as needed for the installation of new dampers. See 01 5221 Special Safety Requirements / ICRA for working requirements in Surgery Area.

3.2 INTERFACE WITH OTHER PRODUCTS

A. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide Pitot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.

3.3 CLEANING

A. If supply, exhaust, or return air ductwork is found to be dirty during construction due to inadequately capped/sealed ductwork or operating fans without filters, the CONTRACTOR shall clean all affected duct systems with high power vacuum machines to the satisfaction of the ARCHITECT. Return air plenums not sealed off during construction shall be cleaned by the CONTRACTOR to the satisfaction of the OWNER. Protect equipment that may be harmed by excessive dirt with filters, or bypass during cleaning. Provide adequate access into ductwork for cleaning purposes.

3.4 SCHEDULES

A. Ductwork Material:

1. ASU Supply/Return: Galvanized Steel
2. General Exhaust: Galvanized Steel

B. Ductwork Pressure Class:

1. Supply: 4-inch
2. Return: 2-inch.
3. Exhaust: 2-inch.

END OF SECTION 23 3100

SECTION 237810 – DUCT HUMIDIFIER

PART 1 GENERAL

1.1 WORK INCLUDED

A. Steam Humidifier, Control Cabinet, Piping and Controls.

1.2 RELATED WORK

A. Section 23 2213 – Steam and Condensate Piping.

B. Section 23 2214 – Steam and Steam Condensate Specialties.

C. Section 23 0926 - Building Automation System and Controls.

1.3 SUBMITTALS

A. See 01 3300 for Submittal Procedures.

B. Submit shop drawings and product data.

C. Shop drawings shall indicate assembly, dimensions, weights, construction details and all field connection details and all mounting and housing details.

D. Product data shall indicate dimensions, weights, capacities, ratings, construction details, electrical characteristics.

E. Submit manufacturer’s installation instructions and operating and maintenance manuals.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site in factory fabricated protective containers.

B. Store in a clean dry place and protect from weather and construction traffic, handle carefully to avoid damage to components, enclosures and finish.

1.5 ENVIRONMENTAL CONDITIONS

A. Do not operate unit for any purpose, temporary or permanent until all water supply and drainage connections have been made and all safety controls are functioning properly.

1.6 WARRANTY

A. Provide manufacturer's one year standard warranty.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Armstrong (Design Manufacturer)

B. Bell & Gossett

2.2 STEAM INJECTION HUMIDIFIERS

A. Description: Steam Humidifiers for electric modulating control: Humidifier shall be the steam separator type providing full separation ahead of an integral steam jacketed control valve which discharges through an internal steam jacketed drying chamber, a silencing chamber, and a steam jacketed distribution manifold.

B. Humidifier shall receive steam at supply pressure and discharge at atmospheric pressure. It shall be furnished with inlet strainer and external inverted bucket steam trap.

C. Separating chamber shall be of a volume and design that will disengage and remove all water droplets and all particulate matter larger than three microns when humidifier is operating at maximum capacity.

D. The stainless steel metering valve shall be integral within the body of the humidifier, and shall be jacketed by steam at supply pressure and temperature to prevent condensation.

E. The stainless steel metering valve shall be a parabolic plug with a ¾" stroke, providing the high rangeability required to achieve full and accurate modulation of steam flow over the entire stroke of the valve.

F. The internal drying chamber shall receive steam at essentially atmospheric pressure and be jacketed by steam at supply pressure and utilize a stainless steel silencing medium.

G. The stainless steel distribution manifold shall provide uniform distribution over its entire length and be jacketed by steam to assure that vapor discharged is free of water droplets. A full-length stainless steel internal silencing screen shall be provided.

H. Humidifier shall be equipped with an interlocked temperature switch to prevent the humidifier from operating before start-up condensate is drained.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install humidifiers as indicated on drawings and as indicated in schedules in accordance with manufacturer’s instructions.

3.2 MANUFACTURERS FIELD SERVICES:

A. Supply services of factory trained representative to check installation for compliance with manufacturer's requirements and to supervise start-up and testing of humidifiers.

3.3 DEMONSTRATION

A. Demonstrate all humidifiers to be fully functional.

END OF SECTION 23 7810

SECTION 238100 – WATER COOLED CHILLER

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Work Included: Water cooled chiller module. Chiller module shall be completely factory wired, charged with refrigerant and tested prior to shipment. Module shall include multiple compressors, dual circuit evaporator, dual circuit condensers, and controls.

1.2 RELATED REQUIREMENTS

A. Section 23 0926 - Building Automation System and Automatic Controls.

B. Section 23 2113 - Hydronic Piping

C. Section 23 2114 - Hydronic Specialties: Valves, strainers, and other hydronic piping specialties.

D. Section 23 2123 - Pumps

E. Electrical Specifications - Wiring Devices.

1.3 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2012.

B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances; Current Edition, Including All Revisions.

1.4 SUBMITTALS

A. See Section 01 3300 Submittal Procedures.

B. Product Data: Manufacturer's data sheets for each product furnished, including:

1. Electrical and certified performance data showing compliance with specifications and project application conditions.
2. Required water flow rates and temperatures for inflow and outflow.
3. Detailed electrical wiring diagrams.
4. Storage and handling requirements and recommendations.

5. Installation instructions.
6. Start-up, troubleshooting, and TAB instructions.
7. Warranty.
8. Shop Drawings.

C. Shop Drawings: Submit complete drawings including cabinet dimensional details and anchor point locations, required clearances, location and sizes of field connections, performance data, electrical wiring diagrams, dry and operation weights, and all required electrical data. Include control wiring diagrams prepared specifically for this project, showing interface to BAS control systems. Coordinate control requirements with BAS Contractor.

D. Field Test Reports. Provide field test reports filled out by factory technician.

E. Operation and Maintenance Data: Include replaceable parts lists, parts sources, and troubleshooting guide.

F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in OWNER's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of the type this section and approved by manufacturer.

C. Unit shall be constructed in accordance with the UL 1995 and NEC standards and be UL or ETL listed.

D. Unit shall be rated and tested in accordance with ARI 550/590 – Standard for Water Chilling Packages.

E. Unit shall meet the safety standards of ANSI/ASHRAE 15 – Safety Standard for Refrigerated Systems.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Verify upon delivery that equipment nameplate data, including electrical data, matches specified and ordered equipment. Verify that refrigerant charge has been retained during shipping.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Store products under cover and elevated above grade.

D. Comply with manufacturer’s installation instructions for rigging, unloading, and transporting units.

E. Protect units on site from physical damage after unloading.

1.7 WARRANTY

A. Entire unit: one year parts. Compressor: five years parts.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Water Cooled Chiller:

1. ArctiChill (Basis of Design)
2. Substitutions: See Section 01 2500 - Substitutions Procedures requirements.

2.2 CHILLER

A. General: Each module shall be assembled on an integral epoxy coated welded channel steel frame and be enclosed with white painted aluminum panels. The unit shall be shipped as individual modules and assembled on site. Each module shall be fully charged with refrigerant and factory tested for capacity and controller functions prior to shipment. Unit must be built for single point power supply connection to a central distribution block. The electrical distribution panel shall incorporate overload protection for each chiller module. The electrical supply connections for each module shall be factory assembled and shipped with each module for field connection into the electrical distribution panel. Unit must be designed to operate with variable flow on both the chiller and condenser loops.

B. Frame: Frame shall be constructed of welded structural channel steel and be epoxy powder coated with an oven baked finish.

C. Cabinet: Epoxy coated aluminum panels on welded steel frame. The cabinet enclosure shall include easily removable access panels for service. Access panels shall be removable via stainless steel fasteners and retaining clips. Unit shall not require access via sheet metal screws or protruding threaded fasteners.

D. Compressors: There shall be one hermetically sealed digital scroll compressor on the lead circuit of the lead module that unloads to 30% of its rated capacity for maximum temperature control, and increased system efficiency. The remainder of the compressors shall be hermetically sealed scroll compressors with service valves, crankcase heaters, oil level sight glasses, suction gas-cooled motor with solid-state sensors in the windings for overload protection, and in-line circuit breakers. There shall be two, independent compressors and refrigerant circuits per module. Compressors shall be mounted to the heavy gauge steel frame with rubber-in-shear isolators.

E. Evaporators: Dual circuit, brazed plate evaporators constructed of 316 stainless steel plates and copper brazing. The supply and return water piping connections to each evaporator shall include manual and electronic isolation valves to allow servicing of each module individually,

while the remaining modules continue to operate and to allow for variable primary flow. The water connections to each evaporator shall utilize rolled groove couplings for service convenience and ease of installation. Evaporators shall be insulated with ¾" closed cell insulation. The minimum working pressure shall be 650 psi. Evaporator piping fluid velocity shall not exceed 4 fps for pipe sizes 2" and smaller, or 7 fps at any point in the system, per ASHRAE Fundamentals Handbook.

F. Condensers: Dual circuit, brazed plate condensers constructed of 316 stainless steel plates and copper brazing. The supply and return water piping connections to each condenser shall include manual and electronic modulating valves to allow servicing of each module individually, while the remaining modules continue to operate. The electronic modulating valve allows for variable flow and condenser head pressure control. The water connections to each condenser shall utilize rolled groove couplings for service convenience and ease of installation. The minimum working pressure shall be 650 psi. Condenser piping fluid velocity shall not exceed 4 fps for pipe sizes 2" and smaller, or 7 fps at any point in the system, per ASHRAE Fundamentals Handbook.

G. Filters: A 60-mesh industrial grade filter strainer shall be factory installed between the header system and each evaporator and condenser inlet.

H. Electronic valves: Electronic and manual valves shall be provided on each evaporator and condenser to permit variable flow through each. The valves shall be butterfly type and have rolled groove connections to permit ease of service. The valves shall be rated for a minimum working pressure of 150 psi. The actuators shall be rated for 24 VAC, and shall include spring returns to allow the modules to continue to operate if there is an actuator failure.

I. Refrigerant piping: Piping shall be Type K seamless copper, and shall have an insulated suction line using closed cell pipe insulation, compressor rotalock service valves, solenoid valves for compressor pumpdown, and Schrader service valves in the suction, discharge, and liquid lines.

J. Water Piping: The water piping shall be Schedule 40 steel, and the evaporator piping shall be insulated using closed cell pipe insulation to prevent condensation. The chiller shall have branch line service valves for the independent isolation of each evaporator and condenser, without affecting the water flow to the remaining modules.

K. Controls: The Master chiller module shall incorporate the Master microprocessor controller. The Master microprocessor shall communicate with the remaining Slave microprocessors in each module via a local network communications protocol. The master microprocessor shall include a phase monitor to protect against low voltage, phase unbalance, phase loss, and phase reversal conditions. Each microprocessor shall include operational switches for each compressor; high and low refrigeration pressure transmitters to provide indication of refrigeration pressures in each refrigeration circuit and provide high and low refrigeration alarms and shut down the corresponding compressor(s); anti-short cycling compressor timers; minimum compressor run timers; facilitate connection to Building Automation System and Remote Monitoring System, the Master controller shall read all analog and fault port values from all Slave module controllers. The Master controller shall be capable of passing values, compatible with the BACnet protocols, to the Building Automation System.

1. Microprocessor: The microprocessor shall provide the following minimum functions and alarms:

    a. Adjustable fluid temperature set point
    b. Multiple stage compressor control, including compressor rotation to provide even compressor usage and wear.
    c. Reset temperature control set point based on decreased load
    d. High and low fluid temperature alarm set points
    e. Water inlet and outlet temperature
    f. Suction and discharge refrigeration pressures on each refrigeration circuit
    g. Compressor run status
    h. Current alarm status
    i. Demand load
    j. Compressor run hours
    k. Number of compressor starts
    l. Alarm logging with minimum of previously 100 logged alarms with time and date of each occurrence
    m. Remote start stop input
    n. Dry contact for general alarm

2. Interface Panel: An operator interface panel shall be installed on the master chiller to allow operator adjustment of user set points, and alarm monitoring.

L. Performance and Capacities:

1. Evaporator: 29.5F LWT, 42.0F EWT. 30% Propylene Glycol.
2. Condenser: 55.3F LWT, 42.0F EWT. Water.
3. Refrigerant: R-410A
4. Maximum operating pressure: 650 psi
5. Piping Connections: 3.0 inch rolled groove.
6. Flow Rate, Evaporator: 40 gpm. 30% Propylene Glycol.
7. Flow Rate, Condenser: 40gpm. Water.
8. Maximum fluid pressure drop: 4.6 psi evaporator. 3.5 psi condenser.
9. Cooling Output: 225 MBtuh at above conditions.
10. Dimensions: 22”wide x 52”long x 68”high.
11. Digital scroll compressor on lead refrigeration circuit. Unloading to 15% of chiller capacity.
12. Electrical Characteristics: 60 Hz, three phase, 460 V.

    a. FLA: 25.4 Amps.
    b. MCA: 30.0 Amps.
    c. MCOP: 42.0 Amps.

13. Equipment of sizes larger than indicated, equipment requiring additional electrical service, larger sized piping or pumps, or other modifications, is not acceptable.

M. Assembly and Test: The unit shall be completely factory assembled, pre-charged and wired. Complete unit must be test operated at factory prior to shipment.

N. Vibration Isolation Pad: Mineral fiber pad between equipment and concrete housekeeping pad.

O. Concrete Housekeeping Pad: Install chiller on reinforced concrete housekeeping pad.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that power supply complies with equipment specifications.

B. Verify that all connections for water and electricity are available, operational, and placed correctly for unit installation.

C. Verify that equipment is undamaged, including refrigerant components and valves and electrical connections.

D. Verify that mounting surface is sound and ready for installation.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

3.3 INSTALLATION

A. Install equipment in accordance with the manufacturer's written installation instructions.

B. Do not obstruct maintenance access to equipment by any type of piping, electrical conduit, or any other utility.

C. Flush and clean piping before placing in operation; take precautions to prevent introduction of debris into piping systems.

D. Start system and adjust controls and equipment so as to give satisfactory operation.

E. Adjust water temperature control system and place in operation so that water quantities circulated are as required.

F. Install chiller unit on reinforced concrete housekeeping pad with vibration padding beneath. Dowel concrete housekeeping pad into existing concrete slab.

G. Install flexible hose on connections to unit piping.

H. Unit shall be installed in accordance with the Manufacturer’s recommendations where shown on the drawings and other provided installation documents.

I. Insulate rolled groove connections and factory installed piping after assembly.

3.4 FIELD QUALITY CONTROL

A. Work with BAS Contractor to provide cooling system sequence as specified. See 23 0926 Sequence of Operations.

B. Within 30 calendar days after acceptable completion of testing, submit each test report for review and approval; include:

1. Unit nameplate data, and actual voltage and ampere consumption.
2. Supply and return water flow and temperatures for evaporator at full load.
3. Supply and return water flow and temperatures for condenser at full load.
4. Date and name and signature of person testing and reporting.

C. Manufacturer's Field Service – Engage the services of factory authorized service technician to provide equipment Start Up to verify installation for proper operation and compliance with manufacturer's recommendations, and to assist the contractor in making adjustments, and to assist in field testing. Technician shall be factory trained on specific manufacturer and model of chiller and shall have extensive experience with start-up and training with specific chiller manufacturer.

3.5 CLOSEOUT ACTIVITIES

A. Training: Upon completion of work and at time designated by Owner, provide services of chiller manufacturer's technical representative for period of not less than four hours for instruction of OWNER operating personnel in proper operation and maintenance of equipment. Training shall not begin until chiller is operating properly as specified.

3.6 PROTECTION

A. Protect installed products until completion of project.

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

END OF SECTION 23 8100