

# **Invitation to Bid**

## **Alaska Psychiatric Institute - DDC Upgrade Project No. ANC 22-57C**

**Bidders are invited to submit sealed bids, in single copy, to:** Upgrade the existing DDC system, complete, at the Alaska Psychiatric Institute. All work is to be performed in accordance with the plans and specifications associated with this document.

**A pre-bid walk through is scheduled for Tuesday May 10, 2022 at 10:00 A.M. The meeting place will be the main entry lobby. The property is located at 2700 Piper Street Anchorage AK 99508 – Bidders are strongly encouraged to attend.**

Project related questions or clarifications: Chris Capps at (907) 269-7816 or email address [chris.capps@alaska.gov](mailto:chris.capps@alaska.gov)

**Bids will be opened publicly at 2:00 pm local time May 26, 2022, at 3601 C Street Suite 578 Anchorage, AK 99503**

Bids, modifications, or withdrawals transmitted by mail must be received no later than 30 minutes prior to the scheduled time of bid opening.

Chris Capps at 3601 C Street - Suite 578 Anchorage Alaska 99503 must receive hand-delivered bids, modifications, or withdrawals prior to the scheduled time of bid opening. (907) 223-0482.

Faxed bid modifications must be addressed to:

DHSS/FMS/Facilities - ATTN: Chris Capps - Fax number: (907) 334-2689

The Engineer's Estimate: less than \$600,000

The Project completion date: December 31, 2022

**Bidders are responsible for checking this website for addenda. Not acknowledging addenda at the time of bid will deem the Bidder non-responsive.**

Issued: May 4, 2022

# **Alaska Psychiatric Institute**

**DDC Upgrade  
PROJECT NO. ANC 22-57C**

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# **Alaska Psychiatric Institute**

**DDC Upgrade  
PROJECT NO. ANC 22-57C**

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STATE OF ALASKA  
DEPARTMENT OF HEALTH & SOCIAL SERVICES

**INVITATION TO BID**  
for Construction Contract

Date May 4, 2022

**Alaska Psychiatric Institute – DDC Upgrade ANC 22-57C**

**Project Name and Number**

Location of Project: Anchorage, Alaska

Contracting Officer: Chris Capps

Issuing Office: Dept. of Health & Social Services, Office of the Commissioner, Finance & Management Services

State Funded [x]

Federal Aid [ ]

Description of Work:

The Engineer's Estimate is: \$600,000.00

All work shall be completed in \_\_\_\_\_ Calendar Days, or by December 31, 2022

Interim Completion dates, if applicable, will be shown in the Special Provisions.

**Bidders are invited to submit sealed bids, in single copy, for furnishing all labor, equipment, and materials and for performing all work for the project described above. Bids will be opened publicly at 2:00 pm local time, at 3601 C Street - Suite 578 Anchorage, Alaska 99503 on the 26th of May 2022.**

**SUBMISSION OF BIDS**

ALL BIDS INCLUDING ANY AMENDMENTS OR WITHDRAWALS MUST BE RECEIVED PRIOR TO BID OPENING. BIDS SHALL BE SUBMITTED ON THE FORMS FURNISHED AND MUST BE IN A SEALED ENVELOPE MARKED AS FOLLOWS:

**Bid for Project:**

**ANC 22-57C**

**Alaska Psychiatric Institute**

**DDC Upgrade**

**ATTN: Chris Capps**

**State of Alaska**

**Department of Health and Social Services**

**Finance & Management Services, Facilities Office**

**3601 C Street, Suite 578 Anchorage, AK 99503**

Bids, modifications, or withdrawals transmitted by mail must be received in the above specified post office box no later than **30 minutes** prior to the scheduled time of bid opening. Hand-delivered bids, amendments or withdrawals must be received at **3601 C Street – Suite 578 Anchorage, Alaska 99503** prior to the scheduled time of bid opening. Faxed bid amendments must be addressed to **Chris Capps**. Fax number: **(907) 334-2689**.

*A bid guaranty is required with each bid in the amount of 5% of the amount bid. (Alternate bid items as well as supplemental bid items appearing on the bid schedule shall be included as part of the total amount bid when determining the amount of bid guaranty required for the project.)*

The Department hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this Invitation, Disadvantaged Business Enterprises (DBEs) will be afforded full opportunity to submit bids and will not be discriminated against on the grounds of race, color, national origin, or sex in consideration for an award.

## NOTICE TO BIDDERS

Bidders are hereby notified that data to assist in preparing bids is available as follows:

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Plans and Specifications may be printed by the Bidder from:

- the State of Alaska website under Public Notices On-line
- OR**
- the Bidder may forward the project website location/address information to the print shop of their choice for printing – all associated printing costs are payable by the Bidder

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All questions relating to technical aspects of the project should be directed to the following.

**Project manager:** Chris Capps, DHSS Building Management Specialist

Fax: (907) 334-2689 \_\_\_\_\_ Phone: (907) 269-7816 \_\_\_\_\_ Email: chris.capps@alaska.gov

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All questions concerning bidding procedures should be directed to:

**ATTN: Chris Capps**  
**State of Alaska**  
**Department of Health and Social Services**  
**Finance & Management Services, Facilities Office**  
**3601 C Street - Suite 578 Anchorage, AK 99503**

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Other Information:

*Alaska Veterans Preference*

To qualify for the Veterans Preference (per AS 36.30.175), the bidder must:

1. Qualify for the Alaska Bidder's Preference
2. Add value by actually performing the services or have prior experience in selling the supplies
3. Qualify as an Alaska Veteran & Complete/sign Alaska Veterans Affidavit (06D-17, dated 4/12)
4. The value of the preference cannot exceed \$5,000.

**STATE OF ALASKA  
DEPARTMENT OF HEALTH & SOCIAL SERVICES**

**INFORMATION TO BIDDERS**

The Department is concerned over the manner in which bids are submitted. Bidders are requested to study and follow the bid assembly instructions as to the method and form for submitting bids so there will be no reason to reject a bid.

**EXAMINATION OF CONTRACT REQUIREMENTS**

Bidders are expected to examine carefully the plans, specifications and all other documents incorporated in the contract to determine the requirements thereof before preparing bids.

Any explanation desired by bidders regarding the meaning or interpretation of drawings and specifications must be requested in writing and with sufficient time allowed for a reply to reach them before the submission of their bids. Oral explanations or instructions given before the award of the contract will not be binding. Any interpretation made will be in the form of an addendum to the specifications or drawings and will be furnished to all bidders and its receipt by the bidder shall be acknowledged.

**CONDITIONS AT SITE OF WORK**

Bidders are expected to visit the site to ascertain pertinent local conditions such as the location, accessibility and character of the site, labor conditions, the character and extent of the existing work within or adjacent thereto, and any other work being performed thereon.

**PREPARATION OF BIDS**

- (a) Bids shall be submitted on the forms furnished, and must be manually signed in ink. If erasures or other changes appear on the forms, each such erasure or change must be initialed by the person signing the proposal.
- (b) The bid schedule will provide for quotation of a price or prices for one or more pay items which may include unit price or lump sum items and alternative, optional or supplemental price schedules or a combination thereof which will result in a total bid amount for the proposed construction.

Where required on the bid form, bidders must quote on all items and **THEY ARE WARNED** that failure to do so will disqualify them. When quotations on all items are not required, bidders should insert the words "no bid" in the space provided for any item not requiring a quotation and for which no quotation is made.

- (c) The bidder shall specify the price or prices bid in figures. On unit price contracts the bidder shall also show the products of the respective unit prices and quantities written in figures in the column provided for the purpose and the total amount of the proposal obtained by adding the amounts of the several items. All the figures shall be in ink or typed.

- (d) Neither conditional nor alternative bids will be considered unless called for.
- (e) Unless specifically called for, telegraphic or telefacsimile bids will not be considered.
- (f) Bid Schedule form should be enclosed in a separate sealed envelope and enclosed with all other bidding forms required at the opening.

## **BID SECURITY**

All bids shall be accompanied by a bid security in the form of an acceptable Bid Bond (Form 06D-14), or a certified check, cashier's check or money order made payable to the State of Alaska. The amount of the bid security is specified on the Invitation to Bid.

Bid Bonds must be accompanied by a legible Power of Attorney.

If the bidder fails to furnish an acceptable bid security with the bid, the bid shall be rejected as non-responsive. Telegraphic notification of execution of Bid Bond does not meet the requirement of bid security accompanying the bid. An individual surety will not be accepted as a bid security.

The bid securities of the two lowest bidders will be held by the Department until the Contract has been executed, after which such bid securities will be returned. All other bid securities will be returned as soon as practicable. If all bids are rejected, all bid securities will be returned as soon as practicable.

## **BIDDERS QUALIFICATIONS**

Before a bid is considered for award, the bidder may be requested by the Department to submit a statement of facts, in detail, as to his previous experience in performing comparable work, his business and technical organization, financial resources, and plant available to be used in performing the contemplated work.

## **SUBMISSION OF BIDS**

Bids must be submitted as directed on the Invitation for Bids. Do not include in the envelope any bids for other work.

## **ADDENDA REQUIREMENTS**

The bid documents provide for acknowledgement individually of all addenda to the drawings and/or specifications on the signature page of the Proposal. All addenda shall be acknowledged on the Proposal or by telegram prior to the scheduled time of bid opening. If no addenda are received by the bidder, the word "None" should be shown as specified.

Every effort will be made by the Department to insure that Contractors receive all addenda when issued. Addenda will be issued to the individual or company to whom bidding documents were issued. Addenda may be issued by any reasonable method such as hand delivery, mail, telefacsimile, telegraph, email, internet download, courier and in special circumstances by phone. Addenda will be issued to the address, telefacsimile number or phone number as stated on the planholder's list unless picked up in person or included with the bid documents. It is the bidder's responsibility to insure that he has received all addenda affecting the Invitation for Bids. No claim or protest will be allowed based on the bidder's allegation that he did not receive all of the addenda

for an Invitation for Bids. The Department is not responsible for issuing addenda to non-registered bidders.

### **WITHDRAWAL OR REVISION OF BIDS**

A bidder may withdraw or revise a bid after it has been deposited with the Department, provided that the request for such withdrawal or revision is received by the designated office, in writing, by telegram, or by telefacsimile, before the time set for opening of bids.

Telegraphic or telefacsimile modifications shall include both the modification of the unit bid price and the total modification of each item modified, but shall not reveal the amount of the total original or revised bids. Form 06D-16 shall be used to submit such modifications.

### **RECEIPT AND OPENING OF BIDS**

- (a) All bids, including any amendment or withdrawal must be received by the Department prior to the scheduled time of bid opening. Any bid, amendment, or withdrawal that has not been actually received by the Department prior to the time of the scheduled bid opening will not be considered.
- (b) No responsibility will be attached to any officer or employee of the Department for the premature opening of, or failure to open, a bid improperly addressed or identified.
- (c) The Department reserves the right to waive any technicality in bids received when such waiver is in the interest of the State.

### **BIDDERS PRESENT**

At the time fixed for bid opening, bids will be publicly opened and read for the information of bidders and others properly interested, who may be present either in person or by representative. The amount of the bid and the name of the bidder shall be compiled and distributed as soon as possible after bid opening. Bids are not open for public inspection until after the Notice of Intent to Award is issued.

### **BIDDERS INTERESTED IN MORE THAN ONE BID**

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

### **REJECTION OF BIDS**

The Department reserves the right to reject any and all bids when such rejection is in the best interest of the State; to reject the bid of a bidder who has previously failed to perform properly, or complete on time, contracts of a similar nature; to reject the bid of a bidder who is not, in the opinion of the Contracting Officer, in a position to perform the contract; and to reject a bid as non-responsive where the bidder fails to furnish the required documents, fails to complete required documents in the manner directed, or makes unauthorized alterations to the bid documents.



## **AWARD OF CONTRACT**

- (a) The letter of award, if the contract is to be awarded, will be issued to the lowest responsible and responsive bidder as soon as practical and usually within 40 calendar days after opening of proposals.
- (b) The successful bidder will be notified of the Department's intent to award the contract and requested to execute certain documents, including the contract form and bonds.
- (c) The contract will be awarded to the successful bidder following receipt by the Department of all required documents, properly executed, within the time specified in the intent to award. Failure to enter into a contract within the specified time shall be grounds for forfeiture of the bid security and consideration of the second low bidder for award.

**STATE OF ALASKA  
DEPARTMENT OF HEALTH & SOCIAL SERVICES**

**SUPPLEMENTARY INFORMATION TO BIDDERS**

This document modifies or adds to the provisions of Department of Health & Social Services form 06D-3, INFORMATION TO BIDDERS.

Following subparagraph (c) under subject area "PREPARATION OF BIDS", add the following subparagraph:

"(C-1) When provided within the supplements to the bid schedule the Bidder shall specify those Alaska bidder and product preferences applicable to their bid. All entries made by the Bidder and designating applicable preferences must conform to the requirements of AS 36.30 and the instructions on the forms to warrant consideration."

Following subject area "REJECTION OF BIDS", add the following subject area:

"CONSIDERATION OF PROPOSALS

After the Proposals are opened and read, they will be compared on the basis identified on the bid schedule and the apparent low Bidder announced. The apparent low Bidder shall, within 5 working days following identification as the apparent low Bidder, submit a list of all firms with which the prime CONTRACTOR intends to execute subcontracts for the performance of the Contract. The list shall include the name, business address, Alaska business license number and contractor's registration number of each proposed Subcontractor.

Upon confirmation of the contents of the proposal the low Bidder will be identified by the DEPARTMENT by telephone and in writing. If the low Bidder differs from the apparent low Bidder then the requirements for Subcontractor listing, as noted above, shall become effective upon the low Bidder at the time of identification.

If a Bidder fails to list a Subcontractor or lists more than one Subcontractor for the same portion of Work and the value of that Work is in excess of one-half of one percent of the total bid, the Bidder agrees that it shall be considered to have agreed to perform that portion of Work without the use of a Subcontractor and to have represented that the Bidder is qualified to perform the Work.

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.

If a Contract is awarded to a Bidder who violates this section, the Bidder agrees that the Contracting Officer may:

- (1) cancel the Contract without any damages accruing to the State; 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.

A Bidder may replace a listed Subcontractor who:

- (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 State;
- (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 prime 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 Contracting Officer to be non-responsive."

Modify subject area "AWARD OF CONTRACT" as follows:

Subparagraph (a) substitute the word "generally" for the phrase "as soon as practical and"

Subparagraph (b) delete and substitute the following:

"All Bidders will be notified of the DEPARTMENT's intent to Award the Contract and the successful Bidder will be requested to execute certain documents, including the Contract form and bonds."



STATE OF ALASKA  
DEPARTMENT OF HEALTH & SOCIAL SERVICES

**REQUIRED DOCUMENTS**

State Funded Contracts

**Alaska Psychiatric Institute – DDC Upgrade – ANC 22-57C**

**REQUIRED FOR BID.** Bids will not be considered if the following documents are not filled out and submitted at the time of bidding:

1. **Bid Form (Form 06D-9)**
  2. **Bid Schedule**
  3. **Bid Bond (Form 06D-14)**
  4. Any bid revisions must be submitted by the bidder prior to bid opening on the following form:  
**Bid Modification (Form 06D-16)**
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**REQUIRED AFTER NOTICE OF APPARENT LOW BIDDER.** The apparent low bidder is required to complete and submit the following document within 5 working days after receipt of written notification:

1. **Subcontractor List (Form 06D-5)**
- 

**REQUIRED FOR AWARD.** In order to be awarded the contract, the successful bidder must completely fill out and submit the following documents within the time specified in the intent to award letter:

1. **Contract (Form 06D-10A)**
2. **DD Form 214 or NGB Form 22 (if claiming Alaska Veterans Preference under AS 36.30.175(d))**
3. **Payment Bond (Form 06D-12)**
4. **Performance Bond (Form 06D-13)**
5. **Contractor's Questionnaire (Form 06D-8)**
6. **Contractor's Certification of Subcontractors (Form 05)**
  - **Located in DIV 1 Section 01126**
7. **Certificate of Insurance (from carrier)**
8. **Dept. of Labor – Notice of Work Form**



STATE OF ALASKA  
DEPARTMENT OF HEALTH & SOCIAL SERVICES

## ALASKA VETERAN'S PREFERENCE AFFIDAVIT

In response to the Invitation to Bid for: **Alaska Psychiatric Institute**  
Project Name and Number: **DDC Upgrade ANC 22-57C**

I certify under penalty of perjury that \_\_\_\_\_  
(Name) qualifies for the Alaska Veteran's Preference under the following conditions:

- (a) If a bidder qualifies under AS 36.30.170(b) as an Alaska bidder and is a qualifying entity, a five percent bid preference shall be applied to the bid price (preference may not exceed \$5,000). In this subsection, "qualifying entity" means a:
  - (1) Sole proprietorship owned by an Alaska Veteran;
  - (2) Partnership under AS 32.06 or AS 32.11 if a majority of the members are Alaska Veterans;
  - (3) Limited Liability Company organized under AS 10.50 if a majority of the individuals are Alaska Veterans.
- (b) To qualify for a preference under this section, a bidder must add value by the bidder itself actually performing, controlling, managing and supervising a significant part of the services provided, or the bidder must have sold supplies of the general nature solicited to other state agencies, governments, or the general public.
- (c) In this section, "Alaska Veteran" means an individual who is a:
  - (1) Resident of this state; and
  - (2) Veteran; means an individual who:
    - (A) Served in the:
      - (i) Armed Forces of the United States, including a reserve unit of the United States armed forces; or
      - (ii) Alaska Territorial Guard, the Alaska Army National Guard, the Alaska Air National Guard, or the Alaska Naval Militia; and
    - (B) Was separated from the service under a condition that was not dishonorable.

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Date



STATE OF ALASKA  
DEPARTMENT OF HEALTH & SOCIAL SERVICES

## BID FORM

For  
**Alaska Psychiatric Institute DDC Upgrade - ANC 22-57C**

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Project Name and Number

By

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Company Name

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Company Address (Street or PO Box, City, State, Zip)

**To the CONTRACTING OFFICER,  
DEPARTMENT OF HEALTH & SOCIAL SERVICES**

In compliance with your Invitation for Bids dated \_\_\_\_\_, the Undersigned proposes to furnish and deliver all the materials and do all the work and labor required in the construction of the above-referenced Project, located at or near Anchorage, **Alaska**, according to the plans and specifications and for the amount and prices named herein as indicated on the Bid Schedule consisting of \_\_\_\_\_ sheet(s), which is made a part of this Bid.

The Undersigned declares that he has carefully examined the contract requirements and that he has made a personal examination of the site of the work; that he understands that the quantities, where such are specified in the Bid Schedule or on the plans for this project, are approximate only and subject to increase or decrease, and that he is willing to perform increased or decreased quantities of work at unit prices bid under the conditions set forth in the Contract Documents.

The Undersigned hereby agrees to execute the said contract and bonds within fifteen calendar days, or such further time as may be allowed in writing by the Contracting Officer, after receiving notification of the acceptance of this bid, and it is hereby mutually understood and agreed that in case the Undersigned does not, the accompanying bid guarantee shall be forfeited to the State of Alaska, Department of Health & Social Services as liquidated damages, and the said Contracting Officer may proceed to award the contract to others.

The Undersigned agrees to commence the work within 10 calendar days and to complete the work by **December 31, 2022**, unless extended in writing by the Contracting Officer.

The Undersigned proposes to furnish Payment Bond in the amount of **100%** and Performance Bond in the amount of **100%** (of the contract), as surety conditioned for the full, complete and faithful performance of this contract.

The Undersigned acknowledges receipt of the following addenda to the drawings and/or specifications (give number and date of each).

Addenda Number	Date Issued

Addenda Number	Date Issued

Addenda Number	Date Issued

### NON-COLLUSION AFFIDAVIT

The Undersigned declares, under penalty of perjury under the laws of the United States, that neither he, nor the firm, association, or corporation of which he is a member, has, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this bid.

The Undersigned has read the foregoing proposal and hereby agrees to the conditions stated therein by affixing his signature below:

\_\_\_\_\_  
Signature of Authorized Company Representative

\_\_\_\_\_  
Typed or Printed Name and Title

\_\_\_\_\_  
Phone Number

\_\_\_\_\_  
Fax Number

\_\_\_\_\_  
Email Address

(See Reverse Side for Instructions)

Contractor: \_\_\_\_\_



## INSTRUCTIONS FOR ALASKA PRODUCTS PREFERENCE WORKSHEET

### Special Note:

All procurements, except those funded from Federal sources, shall contain Contract provisions for the preference of Alaska products. The products listed by the Bidder on this worksheet have been selected for the referenced project from the "Alaska Product Preference List" which was in force 30 days prior to the advertisement date of this contract. Bidders may obtain a copy of the appropriate listing "Alaska Preference List" by contacting their local DCED office or by writing: Dept. of Commerce & Economic Development, Alaska Products Preference Listing, P.O. Box D, Juneau, AK 99811.

### BIDDERS INSTRUCTIONS:

A. **General.** The Contracting Agency may request documentation to support entries made on this form. False presentations may be subject to AS 36.30.687. All Bidder's entries must conform to the requirements covering bid preparations in general. Discrepancies in price extensions shall be resolved by multiplying the declared total value times the preference percentage and adjusting any resulting computation accordingly.

### B. **Form Completion - BASIC BIDS.**

(1) Enter project number and name, the words "Basic Bid" and the CONTRACTOR'S name in the heading of each page as provided.

(2) The Bidder shall compare those candidate products appearing on the preference listing (see Special Notice comments above) against the requirements of the technical specifications appearing in the contract documents. If the Bidder determines that a candidate product can suitably meet the contract requirements, then that product may be included in the worksheet as follows.

(3) For each suitable product submitted under the "Basic Bid" enter:

- ! the product name, generic description and its corresponding technical specification section number under the heading "PRODUCT",
- ! the company name of the Alaska producer under the heading "MANUFACTURER", and,
- ! the product class (I, II, or III) and preference percentage (3, 5, or 7%, respectively) under the "CLASS/%" heading.

(4) For each product appearing on the list and to be utilized by the CONTRACTOR enter:

- ! under the heading "TOTAL DECLARED VALUE" the manufacturer's quoted price of the product, (caution: this value is to be the manufacturer's quoted price at the place of origin and shall not include costs for freight, handling or miscellaneous charges of incorporating the product into the Work), and
- ! the resulting preference--ie.: the preference percentage times the total declared value amount -- under the heading "REDUCTION AMOUNT".

(5) Continue for all "suitable" basic bid products. If the listing exceeds one page enter the words "Page # SUB" in front of the word "TOTAL" and on the first entry line of the following page enter "SUBTOTAL OF REDUCTION AMOUNT FROM PREVIOUS PAGE".

(6) On the final page of the listing enter "BASIC BID PREFERENCE GRAND" immediately before the word "TOTAL".

(7) Total the entries in the "REDUCTION AMOUNT" column for each page by commencing at the first entry for that page. If a continuation page exists, ensure that the subtotal from the previous page is computed into the running total. Number pages as appropriate.

(8) Compute a Grand Total for the Basic Bid Preference. Enter this amount on the final page of the worksheet and at line or column "C" on the Bid Schedule or Bid Schedule Summary Sheet as appropriate. Submit worksheet(s) with Bid Schedule Summary Sheet.

### C. **Forms Completion - ALTERNATE BIDS.**

(1) Enter project number and name, the words "ALTERNATE BID # \_\_\_\_\_", and CONTRACTOR'S name in the heading of each page as provided.

(2) On the first entry line enter "ADDITIONAL ALASKA PRODUCTS FOR ALTERNATE BID

# \_\_\_\_\_", and repeat procedures 2 through 5 under part B of these Bidder's instructions except that references to "Basic Bid" shall be replaced with the words "Alternate Bid # \_\_\_\_\_".

(3) Following the listing of all additional Alaska products enter the words "ADDITIONAL PRODUCTS PREFERENCE FOR ALTERNATE BID # \_\_\_\_\_--SUBTOTAL" and enter a subtotal amount for all additional products as listed. Subtotal amount to be determined by adding all additional product entries in the "REDUCTION AMOUNT" column.

(4) Skip three lines and enter "LESS THE FOLLOWING NON-APPLICABLE ALASKA PRODUCTS".

(5) Beginning on the next line enter the product name and manufacturer of each Alaska Product appearing on the "Basic Bid" listing which would be deleted or reduced from the Project should the "Alternate Bid" be selected. Details of entry need only be sufficient to clearly reference the subject product. (ie. "Prehung Doors by Alaska Door Co. in lieu of "Prehung Solid Core Wood Door, model "Super Door", Section 08210, by Alaska Door Co., Anchorage.) Products being reduced shall specify the amount of the reduction. Should no products require deletion enter "None". When a product is listed as a "NON-APPLICABLE ALASKA PRODUCT" for this alternate bid and if under the basic bid the Bidder received a preference on his basic bid as a result of that product, then the applicable entries under the headings "TOTAL DECLARED VALUE" and "REDUCTION AMOUNT" (for each product and from the basic bid listing) shall also be entered into the corresponding headings of this form. Where only a portion of the product has been deleted, the entry (which will differ from those on the basic bid listing) may be "pro-rated" or as otherwise substantiated.

(6) Following the listing of all non-applicable Alaska products enter the words "NON-APPLICABLE PRODUCTS PREFERENCE FORM BASIC BID --SUBTOTAL" and enter a subtotal amount for all non-applicable products as listed. Subtotal amount to be determined by adding all non-applicable entries in the "REDUCTION AMOUNT" column.

(7) At the bottom of the final page enter the words "ALTERNATE BID # \_\_\_\_\_ PREFERENCE GRAND" immediately before the word "TOTAL".

(8) Compute a Grand Total for the Alternate Bid Preference (for Alternate # \_\_\_\_\_) by subtracting the non-applicable product preference subtotal from the additional product preference subtotal. Enter on the final page as provided and at the corresponding line in column "C" on the Bid Schedule Summary Sheet. Submit worksheet(s) with the Bid Schedule Summary Sheet.

(9) A separate listing for each alternate bid is required.

## **BID SCHEDULE**

Project: **Alaska Psychiatric Institute – DDC Upgrade – ANC 22-57C**

Bidders Please Note: Before preparing this bid schedule, read carefully, "Information to Bidders", "Supplementary Information to Bidders", and the following:

The Bidder shall insert a fixed price in figures opposite each pay item that appears in the bid schedule to furnish all labor, material, equipment, supervision, and provide all work for each item listed. No price is to be entered or tendered for any item not appearing in the bid schedule. Conditioned or qualified bids will be considered non-responsive.

PAY ITEM	DESCRIPTION OF PAY ITEM	TOTAL BID PRICE, IN FIGURES
----------	-------------------------	-----------------------------

**1. BASIC BID**      All work described in the Specifications and Construction Documents for the Project # **ANC 22-57C**

- |    |  |          |
|----|--|----------|
| a. | Lump Sum Total Basic Bid   | \$ _____ |
| b. | Alaska Bidder's Preference - (5% of Basic Bid)                           | \$ _____ |
| c. | Alaska Veterans Preference - 5% of Basic Bid<br>(May not exceed \$5,000) | \$ _____ |
| d. | Alaska Products Preference - (Attach worksheet(s))                       | \$ _____ |
| e. | Adjusted Basic Bid: (a – b – c - d)                                      | \$ _____ |

\_\_\_\_\_  
Contractor's Name (Printed)

\_\_\_\_\_  
Alaska Contractor's Registration #      Expires

\_\_\_\_\_  
Alaska Business License #      Expires



STATE OF ALASKA  
DEPARTMENT OF HEALTH & SOCIAL SERVICES

**BID BOND**

For

**Alaska Psychiatric Institute – DDC Upgrade – ANC 22-57C**

**Project Name and Number**

DATE BOND EXECUTED: \_\_\_\_\_

PRINCIPAL (Legal name and business address):

TYPE OF ORGANIZATION:

	<input type="checkbox"/> Individual	<input type="checkbox"/> Partnership
	<input type="checkbox"/> Joint Venture	<input type="checkbox"/> Corporation
STATE OF INCORPORATION:		

SURETY (IES) (Name and business address):

A.	B.	C.
PENAL SUM OF BOND:		DATE OF BID:

We, the PRINCIPAL and SURETY above named, are held and firmly bound to the State (State of Alaska), in the penal sum of the amount stated above, for the payment of which sum will be made, we bind ourselves and our legal representatives and successors, jointly and severally, by this instrument.

THE CONDITION OF THE FOREGOING OBLIGATION is that the Principal has submitted the accompanying bid in writing, date as shown above, on above-referenced Project in accordance with contract documents filed in the office of the Contracting Officer, and under the Invitation for Bids therefore, and is required to furnish a bond in the amount stated above.

If the Principal's bid is accepted and he is offered the proposed contract for award, and if the Principal fails to enter into the contract, then the obligation to the State created by this bond shall be in full force and effect.

If the Principal enters into the contract, then the foregoing obligation is null and void.

**PRINCIPAL**

Signature(s)	1.	2.	3.
Name(s) & Title(s) (Typed)	1.	2.	3.

Corporate  
Seal

See Instructions on Reverse

**CORPORATE SURETY(IES)**

<b>Surety A</b>	Name of Corporation	State of Incorporation	Liability Limit \$
Signature(s)	1.	2.	Corporate Seal
Name(s) & Titles (Typed)	1.	2.	

<b>Surety B</b>	Name of Corporation	State of Incorporation	Liability Limit \$
Signature(s)	1.	2.	Corporate Seal
Name(s) & Titles (Typed)	1.	2.	

<b>Surety C</b>	Name of Corporation	State of Incorporation	Liability Limit \$
Signature(s)	1.	2.	Corporate Seal
Name(s) & Titles (Typed)	1.	2.	

**INSTRUCTIONS**

1. This form shall be used whenever a bid bond is submitted.
2. Insert the full legal name and business address of the Principal in the space designated. If the Principal is a partnership or joint venture, the names of all principal parties must be included (e.g., "Smith Construction, Inc. and Jones Contracting, Inc. DBA Smith/Jones Builders, a joint venture"). If the Principal is a corporation, the name of the state in which incorporated shall be inserted in the space provided.
3. Insert the full legal name and business address of the Surety in the space designated. The Surety on the bond may be any corporation or partnership authorized to do business in Alaska as an insurer under AS 21.09. Individual sureties will not be accepted.
4. The penal amount of the bond may be shown either as an amount (in words and figures) or as a percent of the contract bid price (a not-to-exceed amount may be included).
5. The scheduled bid opening date shall be entered in the space marked Date of Bid.
6. The bond shall be executed by authorized representatives of the Principal and Surety. Corporations executing the bond shall also affix their corporate seal.
7. Any person signing in a representative capacity (e.g., an attorney-in-fact) must furnish evidence of authority if that representative is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved.
8. The states of incorporation and the limits of liability of each surety shall be indicated in the spaces provided.
9. The date that bond is executed must not be later than the bid opening date.



STATE OF ALASKA  
DEPARTMENT OF HEALTH AND SOCIAL SERVICES

## BID MODIFICATION

Alaska Psychiatric Institute – DDC Upgrade – ANC 22-57C

Project Name and Number

Modification Number: \_\_\_\_\_

**Note: All revisions shall be made to the unadjusted bid amount(s).**

**Changes to the adjusted bid amounts will be computed by the Department.**

PAY ITEM NO.	PAY ITEM DESCRIPTION	REVISION TO UNIT BID PRICE +/-	REVISION TO BID AMOUNT +/-
		N/A	

**TOTAL REVISION: \$** \_\_\_\_\_

\_\_\_\_\_  
Name of Bidding Firm

\_\_\_\_\_  
Responsible Party Signature

\_\_\_\_\_  
Date

This form may be duplicated if additional pages are needed.



STATE OF ALASKA  
DEPARTMENT OF HEALTH & SOCIAL SERVICES

SUBCONTRACTOR LIST

Alaska Psychiatric Institute – DDC Upgrade – ANC 22-57C  
Project Name and Number

The apparent low bidder shall complete this form and submit it so as to be received by the Contracting Officer prior to the close of business on the fifth working day after receipt of written notice from the Department.

Failure to submit this form with all required information by the due date will result in the bidder being declared non-responsive and may result in the forfeiture of the Bid Security.

Scope of work must be clearly defined. If an item of work is to be performed by more than one firm, indicate the portion or percent of work to be done by each.

**Check as applicable:** ☐ All work on the below-referenced project will be accomplished without subcontracts greater than ½ of 1% of the contract amount.  
**OR**  
☐ Subcontractor List is as follows:

FIRM NAME, ADDRESS, & PHONE No.	AK BUSINESS LICENSE No. & CONTRACTOR'S REGISTRATION No.	SCOPE OF WORK TO BE PERFORMED

CONTINUE SUBCONTRACTOR INFORMATION ON REVERSE

I hereby certify the listed Alaska Business licenses and Contractor's registrations were valid at the time bids were opened for this project.

\_\_\_\_\_  
Signature of Authorized Company Representative Title

\_\_\_\_\_  
Company Name Company Address (Street or PO Box, City, State, Zip)

\_\_\_\_\_  
Date Phone Number





STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES  
Civil Rights Office – DBE Program

## BIDDER REGISTRATION

All firms must register annually or prior to project award with the Alaska Department of Transportation and Public Facilities (DOT&PF) Civil Rights Officer (CRO). Complete this form for each contractor and subcontractor. Firms will be listed on the bidder registration online directory <http://www.dot.state.ak.us/cvlrts/bidreg.shtml>.

Name of Firm: \_\_\_\_\_

Street Address: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Contact Name: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Fax number: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

Date Firm was Established: \_\_\_\_\_

**The firm listed above is a** (check all that apply):

- |                    |                          |   |
|--------------------|--------------------------|---|
| Prime Contractor?  | <input type="checkbox"/> |   |
| Subcontractor?     | <input type="checkbox"/> | Identify specialty:                     |
| Service Provider?  | <input type="checkbox"/> | Identify service:                       |
| Material Supplier? | <input type="checkbox"/> | Identify material:                      |
| Manufacturer?      | <input type="checkbox"/> | Identify product:                       |
| Certified DBE? *   | <input type="checkbox"/> | *DBE- Disadvantaged Business Enterprise |

**Firm's gross annual receipts:**

- ☐ < \$500,000  
☐ \$500,000- \$999,999  
☐ \$1,000,000- \$4,999,999  
☐ \$5,000,000- \$9,999,999  
☐ \$10,000,000- \$16,999,999  
☐ > \$17,000,000

**Type of contracts/proposals bid by the firm** (check all that apply):

- ☐ Highways ☐ Airports ☐ Transit ☐ AMHS

\_\_\_\_\_  
Signature of Company Representative

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

Send this completed form to:  
**ADOT&PF Civil Rights Office**  
**PO Box 196900**  
**Anchorage, Alaska 99519-6900**

OR You may fax your completed form to:  
**(907) 269-0847**

If you have any questions, please call **(907) 269-0851**.





STATE OF ALASKA  
DEPARTMENT OF HEALTH & SOCIAL SERVICES

## CONSTRUCTION CONTRACT

**Alaska Psychiatric Institute – DDC Upgrade – ANC 22-57C**  
**Project Name and Number**

This CONTRACT, between the STATE OF ALASKA, DEPARTMENT OF HEALTH & SOCIAL SERVICES, herein called the Department, acting by and through its Contracting Officer, and

**Company Name**

**Company Address (Street or PO Box, City, State, Zip)**

a/an ☐ Individual ☐ Partnership ☐ Joint Venture ☐ Sole Proprietorship ☐ Corporation incorporated under the laws of the State of \_\_\_\_\_, its successors and assigns, herein called the Contractor, is effective the date of the signature of the Contracting Officer on this document.

WITNESSETH: That the Contractor, for and in consideration of the payment or payments herein specified and agreed to by the Department, hereby covenants and agrees to furnish and deliver all the materials and to do and perform all the work and labor required in the construction of the above-referenced project at the prices bid by the Contractor for the respective estimated quantities aggregating approximately the sum of

\_\_\_\_\_ Dollars  
(\$ \_\_\_\_\_), and such other items as are mentioned in the original Bid, which Bid and prices named, together with the Contract Documents are made a part of this Contract and accepted as such.

It is distinctly understood and agreed that no claim for additional work or materials, done or furnished by the Contractor and not specifically herein provided for, will be allowed by the Department, nor shall the Contractor do any work or furnish any material not covered by this Contract, unless such work is ordered in writing by the Department. In no event shall the Department be liable for any materials furnished or used, or for any work or labor done, unless the materials, work, or labor are required by the Contract or on written order furnished by the Department. Any such work or materials which may be done or furnished by the Contractor without written order first being given shall be at the Contractor's own risk, cost, and expense and the Contractor hereby covenants and agrees to make no claim for compensation for work or materials done or furnished without such written order.

The Contractor further covenants and agrees that all materials shall be furnished and delivered and all labor shall be done and performed, in every respect, to the satisfaction of the Department, on or before: December 31, 2022. It is expressly understood and agreed that in case of the failure on the part of the Contractor, for any reason, except with the written consent of the Department, to complete the furnishing and delivery of materials and the doing and performance of the work before the aforesaid date, the Department shall have the right to deduct from any money due or which may become due the Contractor, or if no money shall be due, the Department shall have the right to recover

**Five Hundred** dollars (\$500.00) per day for each calendar day elapsing between the time stipulated for the completion and the actual date of completion in accordance with the terms hereof; such deduction to be made, or sum to be recovered, not as a penalty but as liquidated damages.

The bonds given by the Contractor in the sum of \$ \_\_\_\_\_ Payment Bond, and \$ \_\_\_\_\_ Performance Bond, to secure the proper compliance with the terms and provisions of this Contract, are submitted herewith and made a part hereof.

IN WITNESS WHEREOF, the parties hereto have executed this Contract and hereby agree to its terms and conditions.

---

## CONTRACTOR

---

Company Name

---

Signature of Authorized Company Representative

---

Typed or Printed Name and Title

---

Date

(Corporate Seal)

---

## STATE OF ALASKA DEPARTMENT OF HEALTH & SOCIAL SERVICES

---

Signature of Contracting Officer

---

Typed or Printed Name

---

Date



STATE OF ALASKA  
DEPARTMENT OF HEALTH & SOCIAL SERVICES

**PERFORMANCE BOND**

Bond No. \_\_\_\_\_

For

**Alaska Psychiatric Institute – DDC Upgrade – ANC 22-57C**  
Project Name and Number

KNOW ALL WHO SHALL SEE THESE PRESENTS:

That \_\_\_\_\_  
of \_\_\_\_\_ as Principal,  
and \_\_\_\_\_  
of \_\_\_\_\_ as Surety,

firmly bound and held unto the State of Alaska in the penal sum of \_\_\_\_\_ Dollars

(\$ \_\_\_\_\_) good and lawful money of the United States of America for the payment whereof,  
well and truly to be paid to the State of Alaska, we bind ourselves, our heirs, successors, executors, administrators, and assigns,  
jointly and severally, firmly by these presents.

WHEREAS, the said Principal has entered into a written contract with said State of Alaska, on the \_\_\_\_\_ of \_\_\_\_\_  
A.D., 20\_\_\_\_, for construction of the above-named project, said work to be done according to the terms of said contract.

Now, THEREFORE, the conditions of the foregoing obligation are such that if the said Principal shall well and truly perform and  
complete all obligations and work under said contract and if the Principal shall reimburse upon demand of the Department of  
Transportation and Public Facilities any sums paid him which exceed the final payment determined to be due upon completion of the  
project, then these presents shall become null and void; otherwise they shall remain in full force and effect.

IN WITNESS WHEREOF, we have hereunto set our hands and seals at \_\_\_\_\_,  
\_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_ A.D., 20\_\_\_\_.

**Principal:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**By:** \_\_\_\_\_

**Contact Name:** \_\_\_\_\_

**Phone: (     )** \_\_\_\_\_

**Surety:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**By:** \_\_\_\_\_

**Contact Name:** \_\_\_\_\_

**Phone: (     )** \_\_\_\_\_

The offered bond has been checked for adequacy under the applicable statutes and regulations:

\_\_\_\_\_  
Alaska Department of Health & Social Services Authorized Representative

\_\_\_\_\_  
Date

## **INSTRUCTIONS**

1. This form shall be used whenever a performance bond is required. There shall be no deviation from this form without approval from the Contracting Officer.
2. The full legal name, business address, phone number, and point of contact of the Principal and Surety shall be typed on the face of the form. Where more than a single surety is involved, a separate form shall be executed for each surety.
3. The penal amount of the bond, or in the case of more than one surety the amount of obligation, shall be typed in words and in figures.
4. Where individual sureties are involved, a completed Affidavit of Individual Surety shall accompany the bond. Such forms are available upon request from the Contracting Officer.
5. The bond shall be signed by authorized persons. Where such person is signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of authority must be furnished.



STATE OF ALASKA  
DEPARTMENT OF HEALTH & SOCIAL SERVICES

**PAYMENT BOND**

Bond No. \_\_\_\_\_

For

**Alaska Psychiatric Institute – DDC Upgrade – ANC 22-57C**  
Project Name and Number

KNOW ALL WHO SHALL SEE THESE PRESENTS:

That \_\_\_\_\_  
of \_\_\_\_\_ as Principal,  
and \_\_\_\_\_  
of \_\_\_\_\_ as Surety,  
firmly bound and held unto the State of Alaska in the penal sum of \_\_\_\_\_ Dollars

(\$ \_\_\_\_\_) good and lawful money of the United States of America for the payment whereof,  
well and truly to be paid to the State of Alaska, we bind ourselves, our heirs, successors, executors, administrators, and assigns,  
jointly and severally, firmly by these presents.

WHEREAS, the said Principal has entered into a written contract with said State of Alaska, on the \_\_\_\_\_ of \_\_\_\_\_  
A.D., 20\_\_\_\_, for construction of the above-referenced project, said work to be done according to the terms of said contract.

Now, THEREFORE, the conditions of the foregoing obligation are such that if the said Principal shall comply with all requirements  
of law and pay, as they become due, all just claims for labor performed and materials and supplies furnished upon or for the work  
under said contract, whether said labor be performed and said materials and supplies be furnished under the original contract, any  
subcontract, or any and all duly authorized modifications thereto, then these presents shall become null and void; otherwise they  
shall remain in full force and effect.

IN WITNESS WHEREOF, we have hereunto set our hands and seals at \_\_\_\_\_,  
\_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_ A.D., 20\_\_\_\_.

**Principal:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**By:** \_\_\_\_\_

**Contact Name:** \_\_\_\_\_

**Phone:** ( ) \_\_\_\_\_

**Surety:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**By:** \_\_\_\_\_

**Contact Name:** \_\_\_\_\_

**Phone:** ( ) \_\_\_\_\_

The offered bond has been checked for adequacy under the applicable statutes and regulations:

Alaska Department of Health & Social Services Authorized Representative

Date

## **INSTRUCTIONS**

1. This form, for the protection of persons supplying labor and material, shall be used whenever a payment bond is required. There shall be no deviation from this form without approval from the Contracting Officer.
2. The full legal name, business address, phone number, and point of contact of the Principal and Surety shall be typed on the face of the form. Where more than a single surety is involved, a separate form shall be executed for each surety.
3. The penal amount of the bond, or in the case of more than one surety the amount of obligation, shall be typed in words and in figures.
4. Where individual sureties are involved, a completed Affidavit of Individual Surety shall accompany the bond. Such forms are available upon request from the Contracting Officer.
5. The bond shall be signed by authorized persons. Where such persons are signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of authority must be furnished.



STATE OF ALASKA  
DEPARTMENT OF HEALTH & SOCIAL SERVICES

CONTRACTOR'S QUESTIONNAIRE

Alaska Psychiatric Institute – DDC Upgrade – ANC 22-57C  
Project Name and Number

A. FINANCIAL

1. Have you ever failed to complete a contract due to insufficient resources?  
[ ] No [ ] Yes If YES, explain:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Describe any arrangements you have made to finance this work: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

B. EQUIPMENT

1. Describe below the equipment you have available and intend to use for this project.

ITEM	QUAN.	MAKE	MODEL	SIZE/ CAPACITY	PRESENT MARKET VALUE

2. What percent of the total value of this contract do you intend to subcontract? \_\_\_\_\_ %

3. Do you propose to purchase any equipment for use on this project?  
[ ] No [ ] Yes If YES, describe type, quantity, and approximate cost:

---

---

---

4. Do you propose to rent any equipment for this work?  
[ ] No [ ] Yes If YES, describe type and quantity:

---

---

---

5. Is your bid based on firm offers for all materials necessary for this project?  
[ ] Yes [ ] No If NO, please explain:

---

---

---

**C. EXPERIENCE**

1. Have you had previous construction contracts or subcontracts with the State of Alaska?  
[ ] Yes [ ] No

Describe the most recent or current contract, its completion date, and scope of work:

---

---

---

---

2. List, as an attachment to this questionnaire, other construction projects you have completed, the dates of completion, scope of work, and total contract amount for each project completed in the past 12 months.

**I hereby certify that the above statements are true and complete.**

\_\_\_\_\_  
Name of Contractor

\_\_\_\_\_  
Name and Title of Person Signing

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



**STATE OF ALASKA  
DEPARTMENT OF HEALTH AND SOCIAL SERVICES  
DOCUMENT 00700 - ISSUED JULY 1985**

**GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT FOR  
BUILDINGS**

- ARTICLE 1 - DEFINITIONS**
- ARTICLE 2 - AUTHORITIES AND LIMITATIONS**
- 2.1 Authorities and Limitations
- 2.2 Evaluations by Contracting Officer
- 2.3 Means and Methods
- 2.4 Visits to Site
- ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE**
- 3.1 Incomplete Contract Documents
- 3.2 Copies of Contract Documents
- 3.3 Scope of Work
- 3.4 Intent of Contract Documents
- 3.5 Discrepancy in Contract Documents
- 3.6 Clarifications and Interpretations
- 3.7 Reuse of Documents
- ARTICLE 4 - LANDS AND PHYSICAL CONDITIONS**
- 4.1 Availability of Lands
- 4.2 Visit to Site/Place of Business
- 4.3 Explorations and Reports
- 4.4 Utilities
- 4.5 Damaged Utilities
- 4.6 Utilities Not Shown or Indicated
- 4.7 Survey Control
- ARTICLE 5 - BONDS AND INSURANCE**
- 5.1 Delivery of Bonds
- 5.2 Bonds
- 5.3 Replacement of Bond and Surety
- 5.4 Insurance Requirements
- 5.5 Indemnification
- ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES**
- 6.1 Supervision of Work
- 6.2 Superintendence by CONTRACTOR
- 6.3 Character of Workers
- 6.4 CONTRACTOR to Furnish
- 6.5 Materials and Equipment
- 6.6 Anticipated Schedules
- 6.7 Finalizing Schedules
- 6.8 Adjusting Schedules
- 6.9 Substitutes or "Or-Equal" Items
- 6.10 Substitute Means and Methods
- 6.11 Evaluation of Substitution
- 6.12 Dividing the Work
- 6.13 Subcontractors
- 6.14 Use of Premises
- 6.15 Structural Loading
- 6.16 Record Documents
- 6.17 Safety and Protection
- 6.18 Safety Representative
- 6.19 Emergencies

	6.20	Shop Drawings and Samples
	6.21	Shop Drawing and Sample Review
	6.22	Maintenance During Construction
	6.23	Continuing the Work
	6.24	Consent to Assignment
	6.25	Use of Explosives
	6.26	CONTRACTOR's Records
<b>ARTICLE</b>	<b>7 -</b>	<b>LAWS AND REGULATIONS</b>
	7.1	Laws to be Observed
	7.2	Permits, Licenses, and Taxes
	7.3	Patented Devices, Materials and Processes
	7.4	Compliance of Specifications and Drawings
	7.5	Accident Prevention
	7.6	Sanitary Provisions
	7.7	Business Registration
	7.8	Professional Registration and Certification
	7.9	Local Building Codes
	7.10	Air Quality Control
	7.11	Archaeological or Paleontological Discoveries
	7.12	Applicable Alaska Preferences
	7.13	Preferential Employment
	7.14	Wages and Hours of Labor
	7.15	Overtime Work Hours and Compensation
	7.16	Covenant Against Contingent Fees
	7.17	Officials Not to Benefit
	7.18	Personal Liability of Public Officials
<b>ARTICLE</b>	<b>8 -</b>	<b>OTHER WORK</b>
	8.1	Related Work at Site
	8.2	Access, Cutting, and Patching
	8.3	Defective Work by Others
	8.4	Coordination
<b>ARTICLE</b>	<b>9 -</b>	<b>CHANGES</b>
	9.1	DEPARTMENT's Right to Change
	9.2	Authorization of Changes within the General Scope
	9.3	Directive
	9.4	Change Order
	9.5	Shop Drawing Variations
	9.6	Changes Outside the General Scope; Supplemental Agreement
	9.7	Unauthorized Work
	9.8	Notification of Surety
	9.9	Differing Site Conditions
<b>ARTICLE</b>	<b>10-</b>	<b>CONTRACT PRICE; COMPUTATION AND CHANGE</b>
	10.1	Contract Price
	10.2	Claim for Price Change
	10.3	Change Order Price Determination
	10.4	Cost of the Work
	10.5	Excluded Costs
	10.6	CONTRACTOR's Fee
	10.7	Cost Breakdown
	10.8	Cash Allowances
	10.9	Unit Price Work
	10.10	Determinations for Unit Prices
	10.11	Disadvantaged and Women Business Enterprises (DBE and WBE) Program
<b>ARTICLE</b>	<b>11-</b>	<b>CONTRACT TIME, COMPUTATION AND CHANGE</b>

- 11.1 Commencement of Contract Time; Notice to Proceed
- 11.2 Starting the Work
- 11.3 Computation of Contract Time
- 11.4 Time Change
- 11.5 Extension Due to Delays
- 11.6 Essence of Contract
- 11.7 Reasonable Completion Time
- 11.8 Delay Damages

**ARTICLE 12 - QUALITY ASSURANCE**

- 12.1 Warranty and Guaranty
- 12.2 Access to Work
- 12.3 Tests and Inspections
- 12.4 Uncovering Work
- 12.5 DEPARTMENT May Stop the Work
- 12.6 Correction or Removal of Defective Work
- 12.7 One Year Correction Period
- 12.8 Acceptance of Defective Work
- 12.9 DEPARTMENT may Correct Defective Work

**ARTICLE 13- PAYMENTS TO CONTRACTOR AND COMPLETION**

- 13.1 Schedule of Values
- 13.2 Preliminary Payments
- 13.3 Application for Progress Payment
- 13.4 Review of Applications for Progress Payments
- 13.5 Stored Materials and Equipment
- 13.6 CONTRACTOR's Warranty of Title
- 13.7 Withholding of Payments
- 13.8 Retainage
- 13.9 Request for Release of funds
- 13.10 Substantial Completion
- 13.11 Access Following Substantial Completion
- 13.12 Final Inspection
- 13.13 Final Completion and Application for Payment
- 13.14 Final Payment
- 13.15 Final Acceptance
- 13.16 CONTRACTOR's Continuing Obligation
- 13.17 Waiver of Claims by CONTRACTOR
- 13.18 No Waiver of Legal Rights

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## ACKNOWLEDGMENT

"The State of Alaska, General Conditions of the Construction Contract for Buildings " is based on the "Standard General Conditions of the Construction Contract" as published by the National Society of Professional Engineers (document number 1910-8, 1983 edition) on behalf of the Engineers Joint Construction Documents Committee. Portions of the NSPE General Conditions are reprinted herein by the express permission of NSPE. Modifications to the NSPE text are made to provide for State laws, regulations, and established procedures.

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## ARTICLE 1 - DEFINITIONS

Wherever used in the Contract Documents the following terms, or pronouns in place of them, are used, the intent and meaning, unless a different intent or meaning is clearly indicated, shall be interpreted as set forth below.

The titles and headings of the articles, sections, and subsections herein are intended for convenience of reference and shall not be considered as having bearing on their interpretation.

Whenever used in the Specifications or other Contract Documents the following terms have the meaning indicated which are applicable to both the singular and plural thereof. Working titles which have a masculine gender, are intended to refer to persons of either sex.

Terms not defined below shall have their ordinary accepted meanings within the context which they are used. Words which have a well-known technical or trade meaning when used to describe work, materials or equipment shall be interpreted in accordance with such meaning. Words defined in Article 1 are capitalized throughout these General Conditions.

**Addenda** - All clarifications, corrections, or changes issued graphically or in writing by the DEPARTMENT after the Advertisement but prior to the opening of Proposals.

**Advertisement** - The public announcement, as required by law, inviting bids for Work to be performed or materials to be furnished.

**Application for Payment** - The form provided by the DEPARTMENT which is to be used by the CONTRACTOR in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

**Approved or Approval** - Means written approval by the Contracting Officer or his authorized representative as defined in Article 2.1.

**A.S** - Initials which stand for Alaska Statute.

**Award** - The acceptance, by the DEPARTMENT, of the successful bid.

**Bid Bond** - A type of Proposal Guaranty.

**Bidder** - Any individual, firm, corporation or any acceptable combination thereof, or joint venture submitting a bid for the advertised Work.

**Calendar Day** - Every day shown on the calendar, beginning and ending at midnight.

**Change Order** - A written order by the DEPARTMENT directing changes to the Contract Documents, within their general scope.

**Conditions of the Contract** - Those portions of the Contract Documents which define the rights and responsibilities of the contracting parties and of others involved in the Work. The Conditions of the Contract include General Conditions, Supplementary Conditions and other conditions.

**Consultant** - The person, firm, or corporation retained directly by the DEPARTMENT to prepare Contract Documents, perform construction administration services, or other Project related services.

**Contingent Sum Work Item** - When the bid schedule contains a Contingent Sum Work Item, the Work covered shall be performed only upon the written Directive of the Project Manager. Payment shall be made as provided in the Directive.

**Contract** - The written agreement between the DEPARTMENT and the CONTRACTOR setting forth the obligations of the parties and covering the Work to be performed, all as required by the Contract Documents.

**Contract Documents** - The Contract form, Addenda, the bidding requirements and CONTRACTOR's bid (including all appropriate bid tender forms), the bonds, the Conditions of the Contract and all other Contract requirements, the Specifications, and the Drawings furnished by the DEPARTMENT to the CONTRACTOR, together with all Change Orders and documents approved by the Contracting Officer, for inclusion, modifications and supplements issued on or after the Effective Date of the Contract.

**Contracting Officer** - The person authorized by the Commissioner to enter into and administer the Contract on behalf of the DEPARTMENT. He has authority to make findings, determinations and decisions with respect to the Contract and, when necessary, to modify or terminate the Contract. The Contracting Officer is identified on the construction Contract.

**CONTRACTOR** - The individual, firm, corporation or any acceptable combination thereof, contracting with the DEPARTMENT for performance of the Work.

**Contract Price** - The total moneys payable by the DEPARTMENT to the CONTRACTOR under the terms of the Contract Documents.

**Contract Time** - The number of Calendar Days or the date specified in the construction Contract and authorized time extensions which identify how much time the CONTRACTOR is allowed to achieve Final Completion.

**Controlling Item** - Any feature of the Work considered at the time by the Contracting Officer as essential to the orderly completion of the Work and which, if delayed, will delay the time of Final Completion of the Contract (such as an item of Work on the critical path of a network schedule).

**Defective** - An adjective which refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or Approval referred to in the Contract Documents, or has been damaged prior to the DEPARTMENT's Approval.

**DEPARTMENT** - The Alaska Department of Health and Social Services. References to "Owner", "State", "Contracting Agency", mean the DEPARTMENT.

**Directive** - A written communication to the CONTRACTOR from the Contracting Officer interpreting or enforcing a Contract requirement or ordering commencement of an item of Work.

**Drawings** - The Drawings which show the character and scope of the Work to be performed and which have been furnished by the DEPARTMENT or the DEPARTMENT's Consultant and are by reference made a part of the Contract Documents.

**Effective Date of the Contract** - The date on which the Contract is fully executed by both CONTRACTOR and the DEPARTMENT.

**Final Acceptance** - The DEPARTMENT's written acceptance of the Work following Final Completion and the performance of all Contract requirements by the CONTRACTOR.

**Final Completion** - The Project (or specified part thereof) has progressed to the point that all required Work is complete as determined by the Contracting Officer.

**General Requirements** - Sections of Division I of the Specifications which contain administrative and procedural requirements as well as requirements for temporary facilities which apply to Specification Divisions 2 through 16.

**Holidays** - In the State of Alaska, Legal Holidays occur on:

1. New Years Day - January 1
2. Martin Luther King's Birthday - Third Monday in January
3. President's Day - Third Monday in February
4. Seward's Day - Last Monday in March
5. Memorial Day - Last Monday in May
6. Independence Day - July 4
7. Labor Day - First Monday in September
8. Alaska Day - October 18
9. Veteran's Day - November 11
10. Thanksgiving Day - Fourth Thursday in November
11. Christmas Day - December 25
12. Every Sunday
13. Every day designated by public proclamation by the President of the United States or the Governor of the State as a legal Holiday.

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, except (12) above, Sunday and the following Monday are both legal Holidays. See Title 44, Alaska Statutes.

**Install** - Means to build into the Work, ready to be used in complete and operable condition and in compliance with Contract Documents.

**Invitation for Bids** - A portion of the bidding documents soliciting bids for the Work to be performed.

**Notice of Intent to Award** - The written notice by the DEPARTMENT to all Bidders identifying the apparent successful Bidder and establishing the DEPARTMENT's intent to execute the Contract when all conditions required for execution of the Contract are met.

**Notice to Proceed** - A written notice to the CONTRACTOR to begin the Work and establishing the date on which the Contract Time begins.

**Payment Bond** - The security furnished by the CONTRACTOR and his Surety to guarantee payment of the debts covered by the bond.

**Performance Bond** - The security furnished by the CONTRACTOR and his Surety to guarantee performance and completion of the Work in accordance with the Contract.

**Project** - The total construction, of which the Work performed under the Contract Documents is the whole or a part, where such total construction may be performed by more than one CONTRACTOR.

**Project Manager** - The authorized representative of the Contracting Officer who is responsible for administration of the Contract.

**Proposal** - The offer of a Bidder, on the prescribed forms, to perform the Work at the prices quoted.

**Proposal Guaranty** - The security furnished with a Proposal to guarantee that the bidder will enter into a Contract if his Proposal is accepted by the DEPARTMENT.

**Regulatory Requirements** - Laws, rules, regulations, ordinances, codes and/or orders.

**Schedule of Values** - The DEPARTMENT's document, submitted by the CONTRACTOR and reviewed by the Contracting Officer, which shall serve as the basis for computing payment and for establishing the value of separate items of Work which comprise the Contract Price.

**Shop Drawings** - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for the CONTRACTOR to illustrate some portion of the Work and all illustrations, brochures, standard schedules,

performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by the CONTRACTOR to illustrate material, equipment, fabrication, or erection for some portion of the Work.

**Specifications** - Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative and procedural details applicable thereto.

**Subcontractor** - An individual, firm, or corporation to whom the CONTRACTOR or any other Subcontractor sublets part of the Contract.

**Substantial Completion** - Although not fully completed, the Work (or a specified part thereof) has progressed to the point where, in the opinion of the Contracting Officer, as evidence by the DEPARTMENT's written notice, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended. The terms "Substantially Complete" and "Substantially Completed" as applied to any Work refer to Substantial Completion thereof.

**Supplemental Agreement** - A written agreement between the CONTRACTOR and the DEPARTMENT covering work that is not within the general scope of the Contract.

**Supplementary Conditions** - The part of the Contract Documents which amends or supplements these General Conditions.

**Supplier** - A manufacturer, fabricator, distributor, materialman or vendor of materials or equipment.

**Surety** - The corporation, partnership, or individual, other than the CONTRACTOR, executing a bond furnished by the CONTRACTOR.

**Unit Price Work** - Work to be paid for on the basis of unit prices.

**Using Agency** - The entity who will occupy or use the completed Project.

**Work** - Work is the act of, and the result of, performing services, furnishing labor, furnishing and incorporating materials and equipment into the Project and performing other duties and obligations, all as required by the Contract Documents. Such Work, however incremental, will culminate in the entire completed Project, or the various separately identifiable parts thereof.

## **ARTICLE 2 - AUTHORIZATION AND LIMITATIONS**

### **2.1 Authorities and Limitations**

- 2.1.1 The Contracting Officer alone, shall have the power to bind the DEPARTMENT and to exercise the rights, responsibilities, authorities and functions vested in the Contracting Officer by the Contract Documents, except that the Contracting Officer shall have the right to designate in writing authorized representatives to act for him. Wherever any provision of the Contract Documents specifies an individual or organization, whether governmental or private, to perform any act on behalf of or in the interest of the DEPARTMENT that individual or organization shall be deemed to be the Contracting Officer's authorized representative under this Contract but only to the extent so specified. The Contracting Officer may, at any time during the performance of this Contract, vest in any such authorized representatives additional power and authority to act for the Contracting Officer or designate additional representatives, specifying the extent of their authority to act for the Contracting Officer; a copy of each document vesting additional authority in or removing that authority from an authorized representative or designating an additional authorized representative shall be furnished to the CONTRACTOR. The head of the Contracting Agency reserves the right to appoint a new Contracting Officer without affecting any of the CONTRACTOR's obligations to the DEPARTMENT under this Contract.
- 2.1.2 The CONTRACTOR shall perform the Work in accordance with any written order (including but not limited to instruction, direction, interpretation or determination) issued by an authorized representative in accordance with the authorized representative's authority to act for the Contracting Officer. The CONTRACTOR assumes all the risk and consequences of performing the Work in accordance with any order (including but not limited to instruction, direction, interpretation or determination) of anyone not authorized to issue such order, and of any order not in writing.

- 2.1.3 Should the Contracting Officer or his authorized representative designate Consultant(s) to act for the DEPARTMENT as provided for in Paragraph 2.1.1, the performance or nonperformance of the Consultant under such authority to act, shall not give rise to any contractual obligation or duty of the Consultant to the CONTRACTOR, any Subcontractor, any Supplier, or any other organization performing any of the Work or any Surety representing them.
- 2.1.4 The term "Contracting Officer" when used in the text of these General Conditions or other Contract Documents following this section shall also mean any duly authorized representative of the Contracting Officer when authorized in accordance with Paragraph 2.1.1.

## **2.2 Evaluations by Contracting Officer:**

- 2.2.1 The Contracting Officer will decide all questions which may arise as to:
- a. Quality and acceptability of materials furnished;
  - b. Quality and acceptability of Work performed;
  - c. Compliance with the schedule of progress;
  - d. Interpretation of Contract Documents;
  - e. Acceptable fulfillment of the Contract on the part of the CONTRACTOR.
- 2.2.2 In order to avoid cumbersome terms and confusing repetition of expressions in the Contract Documents the terms "as ordered", "as directed", "as required", "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 it shall be understood as if the expression were followed by the words "the Contracting Officer".
- When such terms are used to describe a requirement, direction, review or judgment of the Contracting Officer 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 Contract Documents (unless there is a specific statement indicating otherwise).
- 2.2.3 The use of any such term or adjective shall not be effective to assign to the DEPARTMENT any duty of 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 2.3 or 2.4.

## **2.3 Means & Methods:**

The means, methods, techniques, sequences or procedures of construction, or safety precautions and the program incident thereto, and the failure to perform or furnish the Work in accordance with the Contract Documents are the sole responsibility of the CONTRACTOR.

## **2.4 Visits to Site/Place of Business:**

The Contracting Officer will make visits to the site and approved remote storage sites at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. The Contracting Officer may, at reasonable times, inspect that part of the plant or place of business of the CONTRACTOR or Subcontractor that is related to the performance of the Contract. Such observations or the lack of such observations shall in no way relieve the CONTRACTOR from his duty to perform the Work in accordance with the Contract Documents.



## **ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE**

### **3.1 Incomplete Contract Documents:**

The submission of a bid by the Bidder is considered a representation that the Bidder examined the Contract Documents to make certain that all sheets and pages were provided and that the Bidder is satisfied as to the conditions to be encountered in performing the Work. The DEPARTMENT expressly denies any responsibility or liability for a bid submitted on the basis of an incomplete set of Contract Documents.

### **3.2 Copies of Contract Documents:**

The DEPARTMENT shall furnish to the CONTRACTOR up to ten copies of the Contract Documents. Additional copies will be furnished, upon request, at the cost of reproduction.

### **3.3 Scope of Work:**

The Contract Documents comprise the entire Contract between the DEPARTMENT and the CONTRACTOR concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the Regulatory Requirements of the place of the Project.

It is specifically agreed between the parties executing this Contract that it is not intended by any of the provisions of the Contract to create in the public or any member thereof a third party benefit, or to authorize anyone not a party to this Contract to maintain a suit pursuant to the terms or provisions of the Contract.

### **3.4 Intent of Contract Documents:**

- 3.4.1 It is the intent of the Contract Documents to describe a functionally complete Project 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 will be supplied, without any adjustment in Contract Price or Contract Time, whether or not specifically called for.
- 3.4.2 Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the Regulatory Requirements of any governmental authority, whether such reference be specific or by implication, shall mean the edition stated in the Contract Documents or if not stated the latest standard specification, manual, code or Regulatory Requirements in effect at the time of Advertisement for the Project (or, on the Effective Date of the Contract if there was no Advertisement). 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 DEPARTMENT and the CONTRACTOR, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to the DEPARTMENT or any of the DEPARTMENT's 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 2.3 or 2.4.

### **3.5 Discrepancy in Contract Documents:**

- 3.5.1 Before undertaking the Work, the CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures, and dimensions shown thereon and all applicable field measurements. Work in the area by the CONTRACTOR shall imply verification of figures, dimensions and field measurements. If, during the above study or during the performance of the Work, the CONTRACTOR finds a conflict, error, discrepancy or omission in the Contract Documents, or a discrepancy between the Contract Documents and any standard specification, manual, code, or Regulatory Requirement which affects the Work, the CONTRACTOR shall promptly report such discrepancy in writing to the Contracting Officer. The CONTRACTOR shall obtain a written interpretation or clarification from the Contracting Officer before proceeding with any Work affected thereby. Any adjustment made by the CONTRACTOR without this determination shall be at his own risk and expense. However, the CONTRACTOR shall not be liable to the DEPARTMENT for failure to report any conflict, error or discrepancy in the Contract Documents unless the CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

### 3.5.2 Discrepancy - Order of Precedence:

When conflicts, errors, or discrepancies within the Contract Documents exist, the order of precedence from most governing to least governing will be as follows:

- Contents of Addenda
- Supplementary Conditions
- General Conditions
- General Requirements
- Technical Specifications
- Drawings
- Recorded dimensions will govern over scaled dimensions
- Large scale details over small scale details
- Schedules over plans
- Architectural drawings over structural drawings Structural drawings over mechanical and electrical drawings

### 3.6 Clarifications and Interpretations:

The Contracting Officer will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents as the Contracting Officer may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents.

### 3.7 Reuse of Documents:

Neither the CONTRACTOR nor any Subcontractor, or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with the DEPARTMENT shall have or acquire any title to or ownership rights in any of the Contract Documents (or copies thereof) prepared by or for the DEPARTMENT and they shall not reuse any of the Contract Documents on extensions of the Project or any other project without written consent of the Contracting Officer.

Contract Documents prepared by the CONTRACTOR in connection with the Work shall become the property of the DEPARTMENT.

## ARTICLE 4 - LANDS AND PHYSICAL CONDITIONS

### 4.1 Availability of Lands:

The DEPARTMENT 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 use of the CONTRACTOR in connection with the Work. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by the DEPARTMENT, unless otherwise provided in the Contract Documents. 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.

### 4.2 Visit to Site:

The submission of a bid by the CONTRACTOR is considered a representation that the CONTRACTOR has visited and carefully examined the site and is satisfied as to the conditions to be encountered in performing the Work and as to the requirements of the Contract Documents.

### 4.3 Explorations and Reports:

1. Reference is made to the Supplementary Conditions for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by the DEPARTMENT in preparation of the Contract Documents. The CONTRACTOR may for his purposes rely upon the accuracy of the factual data contained in such reports, but not upon interpretations or opinions drawn from such factual data contained therein or for the completeness or sufficiency thereof. Except as indicated in the immediately preceding sentence and in paragraphs 4.4 and 9.9, CONTRACTOR shall have full responsibility with respect to surface and subsurface conditions at the site.

2. **Hazardous Materials:**

The CONTRACTOR is to be aware under 29 CFR 1926.1101(k)(2)(ii) Construction Industry Standards, any building or facility constructed prior to 1980 may contain suspected Hazardous Materials. All known or perceived known Hazardous Materials information will be provided by the DEPARTMENT's facility staff to the CONTRACTOR upon request. Any new suspected Hazardous Materials encountered by the CONTRACTOR shall be made known to the DEPARTMENT within 3 business days of discovery. Once notified the DEPARTMENT will have an Environmental Assessment completed to verify if hazardous materials exist.

**4.4 Utilities:**

The horizontal and vertical locations of known underground utilities as shown or indicated by the Contract Documents are approximate and are based on information and data furnished to the DEPARTMENT by the owners of such underground utilities.

4.4.2 The CONTRACTOR shall have full responsibility for:

- a. Reviewing and checking all information and data concerning utilities.
- b. Locating all underground utilities shown or indicated in the Contract Documents which are affected by the Work.
- c. Coordination of the Work with the owners of all utilities during construction.
- d. Safety and protection of all utilities as provided in paragraph 6.17.
- e. Repair of any damage to utilities resulting from the Work in accordance with 4.4.4 and 4.5.

4.4.3 If Work is to be performed by any utility owner, the CONTRACTOR shall cooperate with such owners to facilitate the Work.

4.4.4 In the event of interruption to any utility service as a result of accidental breakage or as result of being exposed or unsupported, the CONTRACTOR shall promptly notify the utility owner and the Contracting Officer. If service is interrupted, repair work shall be continuous until the service is restored. No Work shall be undertaken around fire hydrants until provisions for continued service has been approved by the local fire authority.

**4.5 Damaged Utilities:**

When utilities are damaged by the CONTRACTOR, the utility owner shall have the choice of repairing the utility or having the CONTRACTOR repair the utility. In the following circumstances, the CONTRACTOR shall reimburse the utility owner for repair costs or provide at no cost to the utility owner or the DEPARTMENT, all materials, equipment and labor necessary to complete repair of the damage:

- a. When the utility is shown or indicated in the Contract Documents.
- b. When the utility has been located by the utility owner.
- c. When no locate was requested by the CONTRACTOR for utilities shown or indicated in the Contract Documents.
- d. All visible utilities.
- e. When the CONTRACTOR could have, otherwise, reasonably been expected to be aware of such utility.

**4.6 Utilities Not Shown or Indicated:**

If, while directly performing the Work, an underground utility is uncovered or revealed at the site which was not shown or indicated in the Contract Documents and which the CONTRACTOR could not reasonably have

been expected to be aware of, the CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency as permitted by paragraph 6.19) identify the owner of such underground utility and give written notice thereof to that owner and to the Contracting Officer. The Contracting Officer will promptly review the underground utility to determine the extent to which the Contract Documents and the Work should be modified to reflect the impacts of the discovered utility. The Contract Documents will be amended or supplemented in accordance with paragraph 9.2 and to the extent necessary through the issuance of a change document by the Contracting Officer. During such time, the CONTRACTOR shall be responsible for the safety and protection of such underground utility as provided in paragraph 6.17. The CONTRACTOR may be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are directly attributable to the existence of any underground utility that was not shown or indicated in the Contract Documents and which the CONTRACTOR could not reasonably have been expected to be aware of.

#### **4.7 Survey Control:**

The DEPARTMENT will identify sufficient horizontal and vertical control data to enable the CONTRACTOR to survey and layout the Work. All survey work shall be performed under the direct supervision of a registered land surveyor when required by paragraph 7.8. Copies of all survey notes will be provided the DEPARTMENT on a weekly basis with variations between the Contract Documents and actual field conditions identified. Survey notes are to be in a format acceptable to the DEPARTMENT.

### **ARTICLE 5 - BONDS, INSURANCE, AND INDEMNIFICATION**

#### **5.1 Delivery of Bonds:**

When the CONTRACTOR delivers the executed Contract to the Contracting Officer, the CONTRACTOR shall also deliver to the Contracting Officer such bonds as the CONTRACTOR may be required to furnish in accordance with paragraph 5.2.

#### **5.2 Bonds:**

5.2.1 The CONTRACTOR shall furnish Performance and Payment Bonds, each in an amount as shown on the Contract as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These bonds shall remain in effect for one year after the date of Final Acceptance and until all obligations under this Contract, except special guarantees as per 12.7, have been met. All bonds shall be furnished on forms provided by the DEPARTMENT (or copies thereof) and shall be executed by such Sureties as are authorized to do business in the State of Alaska. The Contracting Officer may at his option copy the Surety with notice of any potential default or liability.

5.2.2 At the option of the CONTRACTOR, bonds may be provided by individual Surety the adequacy of which shall be determined by the Contracting Officer. Any costs incurred by the CONTRACTOR or individual Surety shall be borne by the CONTRACTOR. Where individual Sureties are used, two individual Sureties must each provide the State of Alaska with security equal to the amount of each bond by one, or a combination of, the following methods:

- a. Escrow account in the name of the DEPARTMENT for the duration of the Contract. Acceptable securities would include, but not necessarily be limited to: Cash; treasury notes; bearer instruments having a specific value, or; money market certificates.
- b. First *Deed of Trust* with the DEPARTMENT designated as beneficiary, against the unencumbered value of the real property located within the State of Alaska or an agreement by any second party, including deeds of trust, mortgage, lien or judgment interests to subrogate their interests to that of the State of Alaska in the real property which has been offered by the individual Surety.

A title insurance policy with the State of Alaska as a named beneficiary and a current (within 3 months) professional appraisal or assessed valuation will be required to ascertain the true value of the property offered as collateral. If buildings or other valued improvements are involved then fire and

casualty insurance with the State of Alaska as a named insured and in limits and coverages acceptable to the Contracting Officer shall be required. The appraiser shall acknowledge in writing that the appraisal is prepared for the benefit of the DEPARTMENT and the DEPARTMENT has the right to rely on its contents. This *Deed* must be recorded in the recording office where the property is located.

With respect to clauses “a” and “b” above the *Deed of Trust* or other accepted security shall not be released until 12 months after Final Acceptance of the Project and settlement of all outstanding claims.

### **5.3 Replacement of Bond and Surety:**

If the Surety on any bond furnished in connection with this Contract is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.2, or otherwise becomes unacceptable to the DEPARTMENT, or if any such Surety fails to furnish reports as to his financial condition as requested by the DEPARTMENT, the CONTRACTOR shall within five days thereafter substitute another bond and Surety, both of which must be acceptable to DEPARTMENT.

An individual Surety may be replaced by a corporate Surety during the course of the Contract period. If the Surety desires to dispose of the collateral posted, the DEPARTMENT may, at its option, accept substitute collateral.

### **5.4 Insurance Requirements:**

5.4.1 The CONTRACTOR shall provide evidence of insurance with a carrier or carriers satisfactory to the DEPARTMENT covering injury to persons and/or property suffered by the State of Alaska or a third party, as a result of operations which arise both out of and during the course of this Contract by the CONTRACTOR or by any Subcontractor. This coverage will also provide protection against injuries to all employees of the CONTRACTOR and the employees of any Subcontractor engaged in Work under this Contract.

5.4.2 The CONTRACTOR shall maintain in force at all times during the performance of Work under this agreement the following policies of insurance. Where specific limits and coverages are shown, it is understood that they shall be the minimum acceptable. The requirements of this paragraph shall not limit the CONTRACTOR’s responsibility to indemnify under paragraph 5.5. Additional insurance requirements specific to this Contract are contained in the Supplementary Conditions, when applicable.

a. Worker’s Compensation Insurance:

The Contractor shall provide and maintain, for all employees engaged in work under this contract, statutory limits coverage as required by AS 23.30.045.

The policy must waive subrogation against the State and include Employer’s Liability Protection with policy limits not less than:

\$500,000 each accident,  
\$500,000 each disease.

b. Commercial General Liability Insurance: on an occurrence policy form covering all operations by or on behalf of the CONTRACTOR with combined single limits not less than:

\$1,000,000 each occurrence

\$1,000,000 for Personal Injury Liability

\$2,000,000 aggregate for Products-Completed Operations

\$2,000,000 general aggregate

The State of Alaska shall be named as additional insured. This insurance shall be considered to be primary and non-contributory to any other insurance carried by the State through self insurance or otherwise.

- c. Automobile Liability Insurance: covering all vehicles used by the Contractor in the performance of services under this agreement with combined single limits not less than:

\$1,000,000 each occurrence

- d. Builder's Risk Insurance: Builder's Risk Insurance is not required by The State Of Alaska for this project.

- e. Other Coverages: As specified in the Supplementary Conditions.

- 5.4.3 All insurance policies shall comply with, and be issued by insurers licensed to transact the business of insurance under AS 21. Failure to maintain insurance may, at the option of the Contracting Officer, be deemed Defective Work and remedied in accordance with the Contract.

Evidence of Insurance, consisting of a certificate of insurance or the policy declaration page with required endorsements attached thereto - all of which have been executed by the insurer's representative and issued to the DEPARTMENT - shall denote the type, amount, class of operations covered, effective (and retroactive) dates, and dates of expiration. Evidence of Insurance must provide for a 30-day prior notice of cancellation, nonrenewal or material change of conditions.

Evidence pertaining to Worker's Compensation, Commercial General Liability, or Automobile Liability is required for Award. All other coverages shall be evidenced prior to commencement of WORK. Acceptance by the DEPARTMENT of deficient evidence does not constitute a waiver of Contract requirements as provided for the Conditions of the Contract.

If a certificate of insurance is submitted as evidence it shall contain the following statement:

"This is to certify that the policies described herein comply with all aspects of the insurance requirements of (Contract Name and Number, and Project Number)."

## **5.5 Indemnification:**

The CONTRACTOR shall indemnify, save harmless, and defend the DEPARTMENT, its agents and its employees from any and all claims, actions, or liabilities for injuries or damages sustained by any person or property arising directly or indirectly from the CONTRACTOR or SUBCONTRACTOR's performance of WORK under this Contract; however, this provision has no effect if, but only if, the sole proximate cause of the injury or damage is the DEPARTMENT's negligence.

## **ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES**

### **6.1 Supervision of Work:**

The CONTRACTOR shall supervise 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. All Work under this Contract shall be performed in a skillful and workmanlike manner. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction.

### **6.2 Superintendence by CONTRACTOR:**

The CONTRACTOR shall keep on the Work at all times during its progress a competent resident superintendent. The Contracting Officer shall be advised in writing of the superintendent's name, local address, and telephone number. This written advice is to be kept current until Final Acceptance by the DEPARTMENT. The superintendent will be the CONTRACTOR's representative at the site and shall have full authority to act and sign documents on behalf of the CONTRACTOR.

All communications given to the superintendent shall be as binding as if given to the CONTRACTOR. The CONTRACTOR shall cooperate with the Contracting Officer in every way possible.

### **6.3 Character of Workers:**

The CONTRACTOR shall provide a sufficient number of competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. The CONTRACTOR shall at all times maintain good discipline and order at the site. The Contracting Officer may, in writing, require the CONTRACTOR to remove from the Work any employee the Contracting Officer deems incompetent, careless, or otherwise detrimental to the progress of the Work, but the Contracting Officer shall have no duty to exercise this right.

### **6.4 CONTRACTOR to Furnish:**

Unless otherwise specified in the General Requirements, the CONTRACTOR shall furnish and assume full responsibility for all materials, equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance testing, start-up and completion of the Work.

### **6.5 Materials and Equipment:**

All materials and equipment shall be of specified quality and new, except as otherwise provided in the Contract Documents. If required by the Contracting Officer, 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 provision of any such instructions will be effective to assign to the DEPARTMENT or any of the DEPARTMENT's 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 2.3 or 2.4.

### **6.6 Anticipated Schedules:**

- 6.6.1 Within reasonable time prior to the preconstruction conference the CONTRACTOR shall submit to the Contracting Officer for review an anticipated progress schedule indicating the starting and completion dates of the various stages of the Work.
- 6.6.2 Within fifteen days after the date of the Notice to Proceed, the CONTRACTOR shall submit to the Contracting Officer for review:

Anticipated schedule of Shop Drawing submissions; and

Anticipated Schedule of Values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work which will be confirmed in writing by the CONTRACTOR at the time of submission.

### **6.7 Finalizing Schedules:**

Prior to processing the first Application for Payment the Contracting Officer and the CONTRACTOR will finalize schedules required by paragraph 6.6. The finalized progress schedule will be acceptable to the DEPARTMENT as providing information related to the orderly progression of the Work to completion within the Contract Time; but such acceptance will neither impose on the DEPARTMENT nor relieve the CONTRACTOR from full responsibility for the progress or scheduling of the Work. If accepted, the finalized schedule of Shop Drawing and other required submissions will be acknowledgment by the DEPARTMENT as providing a workable arrangement for processing the submissions. If accepted, the finalized Schedule of Values will be acknowledgment by the DEPARTMENT as an approximation of anticipated value of Work accomplished over the anticipated Contract Time. Receipt and acceptance of a schedule submitted by the CONTRACTOR shall not be construed to assign responsibility for performance or contingencies to the

DEPARTMENT or relieve the CONTRACTOR of his responsibility to adjust his forces, equipment, and work schedules as may be necessary to insure completion of the Work within prescribed Contract Time. Should the prosecution of the Work be discontinued for any reason, the CONTRACTOR shall notify the Contracting Officer at least 24 hours in advance of resuming operations.

#### **6.8 Adjusting Schedules:**

Upon substantial changes to the schedule or upon request the CONTRACTOR shall submit to the Contracting Officer for acceptance (to the extent indicated in paragraph 6.7 and the General Requirements) adjustments in the schedules to reflect the actual present and anticipated progress of the Work.

#### **6.9 Substitutes or "Or-Equal" Items:**

- 6.9.1 Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that substitution is limited or not permitted, materials or equipment of other Suppliers may be accepted by the Contracting Officer only if sufficient information is submitted by the CONTRACTOR which clearly demonstrates to the Contracting Officer that the material or equipment proposed is equivalent or equal in all aspects to that named. The procedure for review by the Contracting Officer will include the following as supplemented in the General Requirements.
- 6.9.2 Requests for review of substitute items of material and equipment will not be accepted by the Contracting Officer from anyone other than the CONTRACTOR.
- 6.9.3 If the CONTRACTOR wishes to furnish or use a substitute item of material or equipment, the CONTRACTOR shall make written application to the Contracting Officer for Approval thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as the specified. The application will state that the evaluation and Approval of the proposed substitute will not delay the CONTRACTOR's timely achievement of Substantial or Final Completion, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with the DEPARTMENT for Work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty.
- 6.9.4 All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by the DEPARTMENT in evaluating the proposed substitute. The DEPARTMENT may require the CONTRACTOR to furnish at the CONTRACTOR's expense additional data about the proposed substitute. The Contracting Officer may reject any substitution request which the Contracting Officer determines is not in the best interest of the DEPARTMENT.

#### **6.10 Substitute Means and Methods:**

If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, the CONTRACTOR may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to the Contracting Officer, if the CONTRACTOR submits sufficient information to allow the Contracting Officer to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by the Contracting Officer will be similar to that provided in paragraph 6.9 as applied by the Contracting Officer and as may be supplemented in the General Requirements.

#### **6.11 Evaluation of Substitution:**

The Contracting Officer will be allowed a reasonable time within which to evaluate each proposed substitute. The Contracting Officer will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without the Contracting Officer's prior written Approval which will be evidenced by either a Change



Order or a Shop Drawing Approved in accordance with Sections 6.20 and 6.21. The Contracting Officer may require the CONTRACTOR to furnish at the CONTRACTOR's expense a special performance guarantee or other Surety with respect to any substitute.

#### **6.12 Dividing the Work:**

The divisions and sections of the Specifications and the identifications of any Drawings shall not control the CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

#### **6.13 Subcontractors:**

The CONTRACTOR may utilize the services of appropriately licensed Subcontractors on those parts of the Work which, under normal contracting practices, are performed by Subcontractors, in accordance with the following conditions:

- 6.13.1 The CONTRACTOR shall not award any Work to any Subcontractor without prior written Approval of the Contracting Officer. This Approval will not be given until the CONTRACTOR submits to the Contracting Officer a written statement concerning the proposed award to the Subcontractor which shall contain required Equal Employment Opportunity documents, evidence of insurance whose limits are acceptable to the CONTRACTOR, and an executed copy of the subcontract. All subcontracts submitted for Approval must contain provisions for payment for Work done by the Subcontractor within 7 days of receipt of payment by the CONTRACTOR. No acceptance by the Contracting Officer of any such Subcontractor shall constitute a waiver of any right of the DEPARTMENT to reject Defective Work.
- 6.13.2 The CONTRACTOR shall be fully responsible to the DEPARTMENT for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions.
- 6.13.3 All Work performed for CONTRACTOR by a Subcontractor will be pursuant to an appropriate written agreement between CONTRACTOR and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the DEPARTMENT and contains waiver provisions as required by paragraph 13.17 and termination provisions as required by Article 14.
- 6.13.4 Nothing in the Contract Documents shall create any contractual relationship between the DEPARTMENT and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of the DEPARTMENT to pay or to see to the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Regulatory Requirements. The DEPARTMENT will not undertake to settle any differences between or among the CONTRACTOR, Subcontractors, or Suppliers.
- 6.13.5 The CONTRACTOR and Subcontractors shall coordinate their work and cooperate with other trades so to facilitate general progress of Work. Each trade shall afford other trades every reasonable opportunity for installation of their work and storage of materials. If cooperative work of one trade must be altered due to lack of proper supervision, or failure to make proper provisions in time by another trade, such conditions shall be remedied by the CONTRACTOR with no change in Contract Price or Contract Time.
- 6.13.6 The CONTRACTOR shall include on his own payrolls any person or persons working on this Contract who are not covered by written subcontract, and shall ensure that all Subcontractors include on their payrolls all persons performing Work under the direction of the Subcontractor.

#### **6.14 Use of Premises:**

The CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Project limits and approved remote storage sites and lands and areas identified in and permitted by Regulatory Requirements, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. 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 DEPARTMENT by any such owner or occupant because of the performance of the Work, the CONTRACTOR shall hold the DEPARTMENT harmless.

#### **6.15 Structural Loading:**

The CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall the CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

#### **6.16 Record Documents:**

The CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Directives, Change Orders, Supplemental Agreements, and written interpretations and clarifications (issued pursuant to paragraph 3.6) in good order and annotated to show all changes made during construction. These record documents together with all Approved samples and a counterpart of all Approved Shop Drawings will be available to the Contracting Officer for reference and copying. Upon completion of the Work, the annotated record documents, samples and Shop Drawings will be delivered to the Contracting Officer. Record documents shall accurately record variations in the Work which vary from requirements shown or indicated in the Contract Documents.

#### **6.17 Safety and Protection:**

The CONTRACTOR alone 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:

- 6.17.1 All employees on the Work and other persons and organizations who may be affected thereby;
- 6.17.2 All the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and
- 6.17.3 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.

The CONTRACTOR shall comply with all applicable Regulatory Requirements 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 utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by the CONTRACTOR with no change in Contract Price or Contract Time except as stated in 4.6, except damage or loss attributable to unforeseeable causes beyond the control of and without the fault or negligence of the CONTRACTOR, including but not restricted to acts of God, of the public enemy or governmental authorities. The CONTRACTOR's duties and responsibilities for the safety and protection of the Work shall continue until Final Acceptance (except as otherwise expressly provided in connection with Substantial Completion).

#### **6.18 Safety Representative:**

The CONTRACTOR shall designate a responsible safety representative at the site. This person shall be the CONTRACTOR's superintendent unless otherwise designated in writing by the CONTRACTOR to the Contracting Officer.

#### **6.19 Emergencies:**

In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the DEPARTMENT, is obligated to act to prevent threatened damage, injury or loss. The CONTRACTOR shall give the Contracting

Officer prompt written notice if the CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If the DEPARTMENT determines that a change in the Contract Documents is required because of the action taken in response to an emergency, a change will be authorized by one of the methods indicated in Paragraph 9.2, as determined appropriate by the Contracting Officer.

## **6.20 Shop Drawings and Samples:**

- 6.20.1 After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, the CONTRACTOR shall submit to the Contracting Officer for review and Approval in accordance with the accepted schedule of Shop Drawing submissions the required number of all Shop Drawings, which will bear a stamp or specific written indication that the CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission. All submissions will be identified as the Contracting Officer may require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable the Contracting Officer to review the information as required.
- 6.20.2 The CONTRACTOR shall also submit to the Contracting Officer for review and Approval with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and accompanied by a specific written indication that the CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission and will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended.
- 6.20.3 Before submission 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.
- 6.20.4 At the time of each submission the CONTRACTOR shall give the Contracting Officer specific written notice of each variation that the Shop Drawings or samples may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on each Shop Drawing submitted to the Contracting Officer for review and Approval of each such variation. All variations of the proposed Shop Drawing from that specified will be identified in the submission and available maintenance, repair and replacement service will be indicated. The submittal will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such variation, including costs of redesign and claims of other Contractors affected by the resulting change, all of which shall be considered by the DEPARTMENT in evaluating the proposed variation. If the variation may result in a change of Contract Time or Price, or Contract responsibility, and is not minor in nature; the CONTRACTOR must submit a written request for Change Order with the variation to notify the DEPARTMENT of his intent. The DEPARTMENT may require the CONTRACTOR to furnish at the CONTRACTOR's expense additional data about the proposed variation. The Contracting Officer may reject any variation request which the Contracting Officer determines is not in the best interest of the DEPARTMENT.

## **6.21 Shop Drawing and Sample Review:**

- 6.21.1 The Contracting Officer will review with reasonable promptness Shop Drawings and samples, but the Contracting Officer's review will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review of a separate item as such will not indicate acceptance of the assembly in which the item functions. The CONTRACTOR shall make corrections required by the Contracting Officer and shall return the required number of corrected copies of Shop Drawings and submit as required new samples for review. The CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by the Contracting Officer on previous submittals.

- 6.21.2 The Contracting Officer's review of Shop Drawings or samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless the CONTRACTOR has in writing advised the Contracting Officer of each such variation at the time of submission as required by paragraph 6.20.4. The Contracting Officer if he so determines, may give written Approval of each such variation by Change Order, except that, if the variation is minor and no Change Order has been requested a specific written notation thereof incorporated in or accompanying the Shop Drawing or sample review comments shall suffice as a modification. Approval by the Contracting Officer will not relieve the CONTRACTOR from responsibility for errors or omissions in the Shop Drawings or from responsibility for having complied with the provisions of paragraph 6.20.3.
- 6.21.3 The DEPARTMENT shall be responsible for all DEPARTMENT review costs resulting from the initial submission and the resubmittal. The CONTRACTOR shall, at the discretion of the Contracting Agency, pay all review costs incurred by the DEPARTMENT as a result of any additional re-submittals.
- 6.21.4 Where a Shop Drawing or sample is required by the Specifications, any related Work performed prior to the Contracting Officer's review and Approval of the pertinent submission will be the sole expense and responsibility of the CONTRACTOR.

**6.22 Maintenance During Construction:**

The CONTRACTOR shall maintain the Work during construction and until Substantial Completion, at which time the responsibility for maintenance shall be established in accordance with paragraph 13.10.

**6.23 Continuing the Work:**

The CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with the DEPARTMENT. No Work shall be delayed or postponed pending resolution of any disputes, disagreements, or claims except as the CONTRACTOR and the Contracting Officer may otherwise agree in writing.

**6.24 Consent to Assignment:**

The CONTRACTOR shall obtain the prior written consent of the Contracting Officer to any proposed assignment of any interest in, or part of this Contract. The consent to any assignment or transfer shall not operate to relieve the CONTRACTOR or his Sureties of any of his or its obligations under this Contract or the Performance Bonds. Nothing herein contained shall be construed to hinder, prevent, or affect an assignment of monies due, or to become due hereunder, made for the benefit of the CONTRACTOR's creditors pursuant to law.

**6.25 Use of Explosives:**

- 6.25.1 When the use of explosives is necessary for the prosecution of the Work, the CONTRACTOR shall exercise the utmost care not to endanger life or property, including new Work and shall follow all Regulatory Requirements applicable to the use of explosives. The CONTRACTOR shall be responsible for all damage resulting from the use of explosives.
- 6.25.2 All explosives shall be stored in a secure manner in compliance with all Regulatory Requirements, and all such storage places shall be clearly marked. Where no Regulatory Requirements apply, safe storage shall be provided not closer than 1,000 feet from any building, camping area, or place of human occupancy.
- 6.25.3 The CONTRACTOR shall notify each public utility owner having structures in proximity to the site of his intention to use explosives. Such notice shall be given sufficiently in advance to enable utility owners to take such steps as they may deem necessary to protect their property from injury. However, the CONTRACTOR shall be responsible for all damage resulting from the use of the explosives, whether or not, utility owners act to protect their property.

**6.26 CONTRACTOR's Records:**

- 6.26.1 Records of the CONTRACTOR and Subcontractors relating to personnel, payrolls, invoices of materials, and any and all other data relevant to the performance of this Contract, must be kept on a generally recognized accounting system. Such records must be available during normal work hours to the

Contracting Officer for purposes of investigation to ascertain compliance with Regulatory Requirements and provisions of the Contract Documents.

- 6.26.2 Payroll records must contain the name and address of each employee, his correct classification, rate of pay, daily and weekly number of hours of work, deductions made, and actual wages paid. The CONTRACTOR and Subcontractors shall make employment records available for inspection by the Contracting Officer and representatives of the U.S. and/or State Department of Labor and will permit such representatives to interview employees during working hours on the Project.
- 6.26.3 Records of all communications between the DEPARTMENT and the CONTRACTOR and other parties, where such communications affected performance of this Contract, must be kept by the CONTRACTOR and maintained for a period of three years from Final Acceptance. The DEPARTMENT or its assigned representative may perform an audit of these records during normal work hours after written notice to the CONTRACTOR.

## **ARTICLE 7 - LAWS AND REGULATIONS**

### **7.1 Laws to be Observed**

The CONTRACTOR shall keep fully informed of all federal and state Regulatory Requirements and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the Work, or which in any way affect the conduct of the Work. The CONTRACTOR shall at all times observe and comply with all such Regulatory Requirements, orders and decrees; and shall protect and indemnify the DEPARTMENT and its representatives against claim or liability arising from or based on the violation of any such Regulatory Requirement, order, or decree whether by the CONTRACTOR, Subcontractor, or any employee of either. Except where otherwise expressly required by applicable Regulatory Requirements, the DEPARTMENT shall not be responsible for monitoring CONTRACTOR's compliance with any Regulatory Requirements.

### **7.2 Permits, Licenses, and Taxes**

- 7.2.1 The CONTRACTOR shall procure all permits and licenses, pay all charges, fees and taxes, and give all notices necessary and incidental to the due and lawful prosecution of the Work. As a condition of performance of this Contract, the CONTRACTOR shall pay all federal, state and local taxes incurred by the CONTRACTOR, in the performance of this Contract. Proof of payment of these taxes is a condition precedent to final payment by the DEPARTMENT under this Contract.
- 7.2.2 The CONTRACTOR's certification that taxes have been paid (as contained in the *Release of Contract*) will be verified with the Department of Revenue and Department of Labor, prior to final payment.
- 7.2.3 If any federal, state or local tax is imposed, charged, or repealed after the date of bid opening and is made applicable to and paid by the CONTRACTOR on the articles or supplies herein contracted for, then the Contract shall be increased or decreased accordingly by a Change Order.

### **7.3 Patented Devices, Materials and Processes**

If the CONTRACTOR employs any design, device, material, or process covered by letters of patent, trademark or copyright, the CONTRACTOR shall provide for such use by suitable legal agreement with the patentee or owner. The CONTRACTOR and the Surety shall indemnify and save harmless the DEPARTMENT, any affected third party, or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright, and shall indemnify the DEPARTMENT for any costs, expenses, and damages which it may be obliged to pay by reason of any infringement, at any time during the prosecution or after the completion of the Work.

### **7.4 Compliance of Specifications and Drawings:**

If the CONTRACTOR observes that the Specifications and Drawings supplied by the DEPARTMENT are at variance with any Regulatory Requirements, CONTRACTOR shall give the Contracting Officer prompt written notice thereof, and any necessary changes will be authorized by one of the methods indicated in paragraph 9.2. as determined appropriate by the Contracting Officer. If the CONTRACTOR performs any Work knowing or having reason to know that it is contrary to such Regulatory Requirements, and without such notice to the

Contracting Officer, the CONTRACTOR shall bear all costs arising therefrom; however, it shall not be the CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings supplied by the DEPARTMENT are in accordance with such Regulatory Requirements.

**7.5 Accident Prevention:**

The CONTRACTOR shall comply with AS 18.60.075 and all pertinent provisions of the Construction Code Occupational Safety and Health Standards issued by the Alaska Department of Labor.

**7.6 Sanitary Provisions:**

The CONTRACTOR shall provide and maintain in a neat and sanitary condition such accommodations for the use of his employees and DEPARTMENT representatives as may be necessary to comply with the requirements of the State and local Boards of Health, or of other bodies or tribunals having jurisdiction.

**7.7 Business Registration:**

Comply with AS 08.18.011, as follows: "it is unlawful for a person to submit a bid or work as a contractor until he has been issued a certificate of registration by the Department of Commerce. A partnership or joint venture shall be considered registered if one of the general partners or venturers whose name appears in the name under which the partnership or venture does business is registered."

**7.8 Professional Registration and Certification:**

All craft trades, architects, engineers and land surveyors, electrical administrators, and explosive handlers employed under the Contract shall specifically comply with applicable provisions of AS 08.18, 08.48, 08.40, and 08.52. Provide copies of individual licenses within seven days following a request from the Contracting Officer.

**7.9 Local Building Codes:**

The CONTRACTOR shall comply with AS 35.10.025 which requires construction in accordance with applicable local building codes to include the obtaining of required permits.

**7.10 Air Quality Control:**

The CONTRACTOR shall comply with all applicable provisions of AS 46.03.04 as pertains to Air Pollution Control.

**7.11 Archaeological or Paleontological Discoveries:**

When the CONTRACTOR's operation encounters prehistoric artifacts, burials, remains of dwelling sites, or paleontological remains, such as shell heaps, land or sea mammal bones or tusks, the CONTRACTOR shall cease operations immediately and notify the Contracting Officer. 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 Contracting Officer 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 shall be covered by an appropriate Contract change document.

**7.12 Applicable Alaska Preferences:**

- 7.12.1 In determining the low bidder for State funded projects, a 5% bid preference has been given to "Alaska bidders", as required under AS 36.30.170. "Alaska bidder" means a person who:
- (1) holds a current Alaska business license;
  - (2) submits a bid for goods, services, or construction under the name as appearing on the person's current Alaska business license
  - (3) has maintained a place of business within the state staffed by the bidder or an employee of the bidder for a period of six months immediately preceding the date of the bid;
  - (4) is incorporated or qualified to do business under the laws of the state, is a sole proprietorship, and the proprietor is a resident of the state or is a partnership, and all partners are residents of the state; and
  - (5) if a joint venture, is composed entirely of ventures that qualify under (1) through (4), above.

- 7.12.2 In determining the low bidder for State funded projects, a 5% bid preference has been given to "Alaska Veteran bidders", as required under AS 36.30.175 for Alaska veteran-owned businesses. To qualify for the Veterans Preference (per AS 36.30.175), the bidder must:
- (1) Qualify for the Alaska Bidder's Preference
  - (2) Add value by actually performing the services or have prior experience in selling the supplies
  - (3) Qualify as an Alaska Veteran
  - (4) The value of the preference cannot exceed \$5,000.
- 7.12.3 In determining the low bidder for State funded projects, an "Alaska products" preference has been given as required under AS 36.30.326 - 36.30.332, when the bid documents designate the use of Alaska products. If the successful Bidder/CONTRACTOR proposes to use an Alaska product and does not do so, a penalty will be assessed against the successful Bidder/CONTRACTOR in an amount equal to the product preference percentage granted to the successful Bidder/CONTRACTOR plus one percent multiplied by the total declared value of the Alaska products proposed but not used.
- 7.12.4 Pursuant to AS 36.15.050 and AS 36.30.322, "agricultural/wood" products harvested in Alaska shall be used in State funded projects whenever they are priced no more than seven percent above agricultural/wood products harvested outside the state and are of a like quality as compared with agricultural/wood products harvested outside the state, when such products are not utilized, the CONTRACTOR shall document the efforts he made towards obtaining agricultural/wood products harvested in Alaska and include in this documentation a written statement that he contacted the manufacturers and suppliers identified on the Department of Commerce and Economic Development's list of suppliers of Alaska forest products concerning the availability of agricultural/wood products harvested in Alaska and, if available, the product prices. The CONTRACTOR's use of agricultural/wood products that fail to meet the requirements of this section shall be subject to the provisions of paragraphs 12.6 through 12.9 relating to Defective Work.
- 7.12.5 The CONTRACTOR shall maintain records, in a format acceptable to the Contracting Officer, which establish the type and extent of "agricultural/wood" and "Alaska" products utilized. All record keeping and documentation associated with the requirements 7.12.2 and 7.12.3 of this paragraph, must be provided to the DEPARTMENT upon written request or as otherwise provided within the Contract Documents.

### **7.13 Preferential Employment:**

The CONTRACTOR shall comply with all applicable and valid laws and regulations regarding the hiring of Alaska residents now in effect or that might subsequently take effect during the term of this Contract. In order to ensure that CONTRACTOR's Subcontractors will comply with all applicable laws and regulations regarding the hiring of Alaska residents now in effect or that might subsequently take effect, the CONTRACTOR shall include in its contracts with Subcontractors under this Contract language that is substantially the same as the first sentence of this provision.

### **7.14 Wages and Hours of Labor:**

- 7.14.1 One certified copy of all payrolls shall be submitted weekly to the State Department of Labor and, upon request, to the Contracting Officer to assure to assure compliance with AS 36.05.040, *Filing Schedule of Employees Wages Paid and Other Information*. The CONTRACTOR shall be responsible for the submission of certified copies of payrolls of all Subcontractors. The certification shall affirm that the payrolls are current and complete, that the wage rates contained therein are not less than the applicable rates referenced in these Contract Documents, and that the classification set forth for each laborer or mechanic conforms with the Work he performed. The CONTRACTOR and his Subcontractors shall attend all hearings and conferences and produce such books, papers, and documents all as requested by the Department of Labor. Should federal funds be involved, the appropriate federal agency shall also receive a copy of the CONTRACTOR's certified payrolls.
- 7.14.2 The following labor provisions shall also apply to this Contract:
- a. The CONTRACTOR and his Subcontractors shall pay all employees unconditionally and not less than once a week;

- b. wages may not be less than those stated under AS 36.05.010, regardless of the contractual relationship between the CONTRACTOR or Subcontractors and laborers, mechanics, or field surveyors;
- c. the scale of wages to be paid shall be posted by the CONTRACTOR in a prominent and easily accessible place at the site of the Work;
- d. the DEPARTMENT shall withhold so much of the accrued payments as is necessary to pay to laborers, mechanics, or field surveyors employed by the CONTRACTOR or Subcontractors the difference between
  - 1. The rates of wages required by the Contract to be paid laborers, mechanics, or field surveyors on the Work, and
  - 2. The rates of wages in fact received by laborers, mechanics or field surveyors.

#### **7.15 Overtime Work Hours and Compensation:**

Pursuant to 40 U.S.C. 327-330 and AS 23.10.060 -.110, the CONTRACTOR shall not require nor permit any laborer or mechanic in any workweek in which he is employed on any Work under this Contract to work in excess of eight hours in any Calendar Day or in excess of forty hours in such workweek on Work subject to the provisions of the *Contract Work Hours and Safety Standards Act* unless such laborer or mechanic receives compensation at a rate not less than one and one half times his basic rate of pay for all such hours worked in excess of eight hours in any Calendar Day or in excess of forty hours in such workweek whichever is the greater number of overtime hours. In the event of any violation of this provision, the CONTRACTOR shall be liable to any affected employee for any amounts due and penalties and to the DEPARTMENT for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violation of this provision in the sum of \$10.00 for each Calendar Day on which such employee was required or permitted to be employed on such Work in excess of eight hours or in excess of the standard workweek of forty hours without payment of the overtime wages required by this paragraph.

#### **7.16 Covenant Against Contingent Fees:**

The CONTRACTOR warrants that no person or selling agent has been employed or retained to solicit or secure this Contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the CONTRACTOR for the purpose of securing business. For breach or violation of this warrant, the DEPARTMENT shall have the right to annul this Contract without liability or, in its discretion, to deduct price of consideration from the Contract or otherwise recover the full amount of such commission, percentage, brokerage, or contingent fee.

#### **7.17 Officials Not to Benefit:**

No member of or delegate to the U.S. Congress, the Alaska State Legislature or other state official shall be admitted to any share or part of this Contract, nor to any benefit that may arise there from. However, this provision shall not be construed to extend to this Contract if made with a corporation for its general benefit.

#### **7.18 Personal Liability of Public Officials:**

In carrying out any of the provisions thereof, or in exercising any power or authority granted to the Contracting Officer by the Contract, there will be no liability upon the Contracting Officer nor upon state employees authorized as his representatives, either personally or as officials of the State of Alaska, it being always understood that in such matters they act as agents and representatives of the DEPARTMENT.

### **ARTICLE 8 - OTHER WORK**

#### **8.1 Related Work at Site:**

- 8.1.1 The DEPARTMENT reserves the right at any time to contract for and perform other or additional work on or near the Work covered by the Contract.
- 8.1.2 When separate contracts are let within the limits of the Project, the CONTRACTOR shall conduct his Work so as not to interfere with or hinder the work being performed by other contractors. The



CONTRACTOR when working on the same Project with other contractors shall cooperate with such other contractors. The CONTRACTOR shall join his Work with that of the others in an acceptable manner and shall perform it in proper sequence to that of others.

- 8.1.3 If the fact that other such work is to be performed is identified or shown in the Contract Documents the CONTRACTOR shall assume all liability, financial or otherwise, in connection with this Contract and indemnify and save harmless the DEPARTMENT from any and all damages or claims that may arise because of inconvenience, delay, or loss experienced by the CONTRACTOR because of the presence and operations of other contractors.
- 8.1.4 If the fact that such other work is to be performed was not identified or shown in the Contract Documents, written notice thereof will be given to the CONTRACTOR prior to starting any such other work. If the CONTRACTOR believes that such performance will require an increase in Contract Price or Contract Time, the CONTRACTOR shall notify the Contracting Officer of such required increase within fifteen (15) calendar days following receipt of the Contracting Officer's notice. Should the Contracting Officer find such increase(s) to be justified, a Change Order will be executed.

## **8.2 Access, Cutting, and Patching:**

The CONTRACTOR shall afford each utility owner and any other contractor who is a party to such a direct contract with the DEPARTMENT (or the DEPARTMENT, if the DEPARTMENT is performing the additional work with the DEPARTMENT'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 the Work with the work of others. 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 such other work with the written consent of the Contracting Officer. The duties and responsibilities of the CONTRACTOR under this paragraph are for the benefit of other contractors to the extent that there are comparable provisions for the benefit of the CONTRACTOR in said direct contracts between the DEPARTMENT and other contractors.

## **8.3 Defective Work by Others:**

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

## **8.4 Coordination:**

If the DEPARTMENT contracts with others for the performance of other work at the site, Contracting Officer will have authority and responsibility for coordination of the activities among the various prime contractors.

# **ARTICLE 9 - CHANGES**

## **9.1 DEPARTMENT's Right to Change**

Without invalidating the Contract and without notice to any Surety, the DEPARTMENT may, at any time or from time to time, order additions, deletions or revisions in the Work within the general scope of the Contract, including but not limited to changes:

- 9.1.1 In the Contract Documents;
- 9.1.2 In the method or manner of performance of the Work;
- 9.1.3 In State-furnished facilities, equipment, materials, services, or site;
- 9.1.4 Directing acceleration in the performance of the Work.

## **9.2 Authorization of Changes within the General Scope.**

Additions, deletions, or revisions in the Work within the general scope of the Contract as specified in 9.1 shall be authorized by one or more of following ways:

- 9.2.1 Directive (pursuant to paragraph 9.3)
- 9.2.2 A Change Order (pursuant to paragraph 9.4)
- 9.2.3 DEPARTMENT's acceptance of Shop Drawing variations from the Contract Documents as specifically identified by the CONTRACTOR as required by paragraph 6.20.4.

## **9.3 Directive**

- 9.3.1 The Contracting Officer shall provide written clarification or interpretation of the Contract Documents (pursuant to paragraph 3.6).
- 9.3.2 The Contracting Officer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Time and are consistent with the overall intent of the Contract Documents.
- 9.3.3 The Contracting Officer may order the Contractor to correct Defective Work or methods which are not in conformance with the Contract Documents.
- 9.3.4 The Contracting Officer may direct the commencement or suspension of Work or emergency related Work (as provided in paragraph 6.19).
- 9.3.5 Upon the issuance of a Directive to the CONTRACTOR by the Contracting Officer, the CONTRACTOR shall proceed with the performance of the Work as prescribed by such Directive.
- 9.3.6 If the CONTRACTOR believes that the changes noted in a Directive may cause an increase in the Contract Price or an extension of Contract Time, the CONTRACTOR shall immediately provide written notice to the Contracting Officer depicting such increases before proceeding with the Directive, except in the case of an emergency. If the Contracting Officer finds the increase in Contract Price or the extension of Contract Time justified, a Change Order will be issued. If however, the Contracting Officer does not find that a Change Order is justified, the Contracting Officer may direct the CONTRACTOR to proceed with the Work. The CONTRACTOR shall cooperate with the Contracting Officer in keeping complete daily records of the cost of such Work. If a Change Order is ultimately determined to be justified, in the absence of agreed prices and unit prices, payment for such Work will be made on a "cost of the work basis" as provided in 10.4

## **9.4 Change Order**

A change in Contract Time, Contract Price, or responsibility may be made for changes within the scope of the Work only by Change Order. Upon receipt of an executed Change Order, the CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents except as otherwise specifically provided. Changes in Contract Price and Contract Time shall be made in accordance with Articles 10 and 11.

## **9.5 Shop Drawing Variations**

Variations by shop drawings shall only be eligible for consideration under 9.4 when the conditions affecting the price, time, or responsibility are identified by the CONTRACTOR in writing and a request for a Change Order is submitted as per 6.20.4.

## **9.6 Changes Outside the General Scope; Supplemental Agreement**

Any change which is outside the general scope of the Contract, as determined by the Contracting Officer, must be authorized by a Supplemental Agreement signed by the appropriate representatives of the DEPARTMENT and the CONTRACTOR.

## **9.7 Unauthorized Work:**

The CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with respect to any work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in this Article 9, except in the case of an emergency as provided in paragraph 6.19 and except in the case of uncovering Work as provided in paragraph 12.4.2.

**9.8 Notification of Surety:**

If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Time) 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 will be adjusted accordingly.

**9.9 Differing Site Conditions:**

- 9.9.1 The CONTRACTOR shall promptly, and before such conditions are disturbed (except in an emergency as permitted by paragraph 6.19), notify the Contracting Officer in writing of: (1) subsurface or latent physical conditions at the site differing materially from those indicated in the Contract, and which could not have been discovered by a careful examination of the site, or (2) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract. The Contracting Officer shall promptly investigate the conditions, and if the Contracting Officer finds that such conditions do materially so differ and cause an increase or decrease in the CONTRACTOR's cost of, or time required for, performance of this Contract, an equitable adjustment shall be made and the Contract modified in writing accordingly.
- 9.9.2 Any claim for additional compensation by the CONTRACTOR under this clause shall be made in accordance with Article 15. In the event that the Contracting Officer and the CONTRACTOR are unable to reach an agreement concerning an alleged differing site condition, the CONTRACTOR will be required to keep an accurate and detailed record which will indicate the actual "cost of the work" done under the alleged differing site condition. Failure to keep such a record shall be a bar to any recovery by reason of such alleged differing site conditions. The Contracting Officer shall be given the opportunity to supervise and check the keeping of such records.

**ARTICLE 10 - CONTRACT PRICE; COMPUTATION AND CHANGE**

**10.1 Contract Price:**

The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to the CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by the CONTRACTOR shall be at his expense without change in the Contract Price. The Contract Price may only be changed by a Change Order or Supplemental Agreement.

**10.2 Claim for Price Change:**

Any claim for an increase or decrease in the Contract Price shall be submitted in accordance with the terms of Article 15, and shall not be allowed unless notice requirements of this Contract have been met.

**10.3 Change Order Price Determination:**

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

- 10.3.1 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 (subject to the provisions of subparagraphs 10.9.1 through 10.9.3, inclusive).
- 10.3.2 By mutual acceptance of a lump sum price which includes overhead and profit.

- 10.3.3 When 10.3.1 and 10.3.2 are inapplicable, on the basis of the "cost of the work" (determined as provided in paragraphs 10.4 and 10.5) plus a CONTRACTOR's fee for overhead and profit (determined as provided in paragraph 10.6).
- 10.3.4 Before a Change Order or Supplemental Agreement is Approved, the CONTRACTOR shall submit cost or pricing data regarding the changed or extra Work. The CONTRACTOR shall certify that the data submitted is, to his best knowledge and belief, accurate, complete and current as of a mutually determined specified date and that such data will continue to be accurate and complete during the performance of the changed or extra Work.

#### **10.4 Cost of the Work:**

The term "cost of the work" means the sum of all costs necessarily incurred and paid by the CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed to in writing by the DEPARTMENT, such costs shall be in amount 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 subparagraph 10.5:

- 10.4.1 Payroll costs for employees in the direct employ of the CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by the DEPARTMENT and the CONTRACTOR. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include superintendents and foremen at the site. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by the DEPARTMENT.
- 10.4.2 Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to the CONTRACTOR unless the DEPARTMENT deposits funds with the CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to the DEPARTMENT. All trade discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to the DEPARTMENT, and the CONTRACTOR shall make provisions so that they may be obtained.
- 10.4.3 Payments made by the CONTRACTOR to Subcontractors for Work performed by Subcontractors. If required by the DEPARTMENT, CONTRACTOR shall obtain competitive quotes from Subcontractors or Suppliers acceptable to the CONTRACTOR and shall deliver such quotes to the DEPARTMENT who will then determine which quotes will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of "cost of the work" plus a fee, the Subcontractor's "cost of the work" shall be determined in the same manner as the CONTRACTOR's "cost of work" as described in paragraphs 10.4 through 10.5; and the Subcontractor's fee shall be established as provided for under subparagraph 10.6.2 clause b. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.
- 10.4.4 Costs of special consultants (including but not limited to engineers, architects, testing laboratories, and surveyors) employed for services necessary for the completion of the Work.
- 10.4.5 Supplemental costs including the following:
- a. The proportion of necessary transportation, travel and subsistence expenses of the CONTRACTOR's employees incurred in discharge of duties connected with the Work.
  - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost less market value of such items used but not consumed which remain the property of the CONTRACTOR.
  - c. Rentals of all construction equipment and machinery and the parts thereof whether rented from the CONTRACTOR or others in accordance with rental agreements Approved by the DEPARTMENT and the costs of transportation, loading, unloading, installation, dismantling and removal thereof - all in accordance

with terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work.

- d. Sales, consumer, use or similar taxes related to the Work, and for which the CONTRACTOR is liable, imposed by Regulatory Requirements.
- e. Deposits lost for causes other than negligence of the CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by the CONTRACTOR in connection with the performance and furnishing of the Work provided they have resulted from causes other than the negligence of the CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and Approval of the DEPARTMENT. No such losses, damages and expenses shall be included in the "cost of the work" for the purpose of determining the CONTRACTOR's fee. If, however, any such loss or damage requires reconstruction and the CONTRACTOR is placed in charge thereof, the CONTRACTOR shall be paid for services a fee proportionate to that stated in paragraphs 10.6.2.a and 10.6.2.b.
- g. The cost of utilities, fuel and sanitary facilities at the site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.
- I. Cost of premiums for additional bonds and insurance required because of changes in the Work and premiums for property insurance coverage within the limits of the deductible amounts established by the DEPARTMENT in accordance with Article 5.

#### **10.5 Excluded Costs:**

The term "cost of the work" shall not include any of the following:

- 10.5.1 Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agency, expeditors, 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 and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 10.4.1 or specifically covered by paragraph 10.4.4 all of which are to be considered administrative costs covered by the CONTRACTOR's fee.
- 10.5.2 Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.
- 10.5.3 Any part of CONTRACTOR's capital expenses including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.
- 10.5.4 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 subparagraph 10.4.5.i above).
- 10.5.5 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.
- 10.5.6 Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 10.4.

#### **10.6 CONTRACTOR's Fee:**

The CONTRACTOR's fee allowed to CONTRACTOR for overhead and profit shall be determined as follows.

- 10.6.1 A mutually acceptable fixed fee; or if none can be agreed upon.
- 10.6.2 A fee based on the following percentages of the various portions of the "cost of the work":
- a. For costs incurred under paragraphs 10.4.1 and 10.4.2, the CONTRACTOR's fee shall be twenty percent;
  - b. For costs incurred under paragraph 10.4.3, the CONTRACTOR's fee shall be ten percent; and if a subcontract is on the basis of "cost of the work" plus a fee, the maximum allowable to CONTRACTOR on account of overhead and profit of all Subcontractors and multiple tiers thereof shall be fifteen percent;
  - c. No fee shall be payable on the basis of costs itemized under paragraphs 10.4.4, 10.4.5 and 10.5;
  - d. The amount of credit to be allowed by the CONTRACTOR to the DEPARTMENT for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in CONTRACTOR's fee by an amount equal to ten percent of the net decrease; and
  - e. When both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with paragraphs 10.6.2.a through 10.6.2.d, inclusive.

**10.7 Cost Breakdown:**

Whenever the cost of any Work is to be determined pursuant to paragraphs 10.4 and 10.5, the CONTRACTOR will submit in a form acceptable to the DEPARTMENT an itemized cost breakdown together with supporting data.

**10.8 Cash Allowances:**

It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be done by such Subcontractors or Suppliers and for such sums within the limit of the allowances as may be acceptable to the Contracting Officer. CONTRACTOR agrees that:

- 10.8.1 The allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and
- 10.8.2 CONTRACTOR's cost for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances. No demand for additional payment on account of any thereof will be valid.

Prior to final payment, an appropriate Change Order will be issued to reflect actual amounts due the CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

**10.9 Unit Price Work:**

- 10.9.1 Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Contract. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by the CONTRACTOR will be made by the DEPARTMENT in accordance with paragraph 10.10.
- 10.9.2 Each unit price will be deemed to include an amount considered by the CONTRACTOR to be adequate to cover the CONTRACTOR's overhead and profit for each separately identified item. If the "Basis of Payment" clause in the Contract Documents relating to any unit price in the bid schedule requires that the said unit price cover and be considered compensation for certain work or material essential to the item, this same work or material will not also be measured or paid for under any other pay item which may appear elsewhere in the Contract Documents.

- 10.9.3 Payment to the CONTRACTOR shall be made only for the actual quantities of Work performed and accepted or materials furnished, in conformance with the Contract Documents. When the accepted quantities of Work or materials vary from the quantities stated in the bid schedule, or change documents, the CONTRACTOR shall accept as payment in full, payment at the stated unit prices for the accepted quantities of Work and materials furnished, completed and accepted; except as provided below:
- a. When the quantity of Work to be done or material to be furnished under any item, for which the total cost of the item exceeds 10% of the total Contract Price, is increased by more than 25 percent of the quantity stated in the bid schedule, or change documents, either party to the Contract, upon demand, shall be entitled to an equitable unit price adjustment on that portion of the Work above 125 percent of the quantity stated in the bid schedule.
  - b. When the quantity of Work to be done or material to be furnished under any major item, for which the total cost of the item exceeds 10% of the total Contract Price, is decreased by more than 25 percent of the quantity stated in the bid schedule, or change documents either party to the Contract, upon demand, shall be entitled to an equitable price adjustment for the quantity of Work performed or material furnished, limited to a total payment of not more than 75 percent of the amount originally bid for the item.

**10.10 Determinations for Unit Prices:**

The Contracting Officer will determine the actual quantities and classifications of Unit Price Work performed by the CONTRACTOR. The Contracting Officer will review with the CONTRACTOR preliminary determinations on such matters before finalizing the costs and quantities on the Schedule of Values. The Contracting Officer's acknowledgment thereof will be final and binding on the CONTRACTOR, unless, within 10 days after the date of any such decisions, the CONTRACTOR delivers to the Contracting Officer written notice of intention to appeal from such a decision.

**10.11 Disadvantaged and Women Business Enterprises (DBE & WBE) Program:**

The Contract Price shall be adjusted by such means as provided in the section entitled "Phase III - Determination of Liquidated Damages and Bonuses", DISADVANTAGED AND WOMEN BUSINESS ENTERPRISE (DBE & WBE) PROGRAM, Form 25A300.

**ARTICLE 11 - CONTRACT TIME; COMPUTATION AND CHANGE**

**11.1 Commencement of Contract Time; Notice to Proceed:**

The Contract Time will commence to run on the day indicated in the Notice to Proceed.

**11.2 Starting the Work:**

No Work on Contract items shall be performed before the effective date of the Notice to Proceed. The CONTRACTOR shall notify the Contracting Officer at least 24 hours in advance of the time actual construction operations will begin. The CONTRACTOR may request a limited Notice to Proceed after Award has been made, to permit him to order long lead materials which could cause delays in Project completion. However, granting is within the sole discretion of the Contracting Officer, and refusal or failure to grant a limited Notice to Proceed shall not be a basis for claiming for delay, extension of time, or alteration of price.

**11.3 Computation of Contract Time:**

- 11.3.1 When the Contract Time is specified on a Calendar Day basis, all Work under the Contract shall be completed within the number of Calendar Days specified. The count of Contract Time begins on the day following receipt of the Notice to Proceed by the CONTRACTOR, if no starting day is stipulated therein.

Calendar Days shall continue to be counted against Contract Time until and including the date of Final Completion of the Work.

- 11.3.2 When the Contract completion time is specified as a fixed calendar date, it shall be the date of Final Completion.

**11.4 Time Change:**

The Contract Time may only be changed by a Change Order or Supplemental Agreement.

#### **11.5 Extension Due to Delays:**

The right of the CONTRACTOR to proceed shall not be terminated nor the CONTRACTOR charged with liquidated or actual damages because of delays to the completion of the Work due to unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including, but not restricted to the following: acts of God or of the public enemy, acts of the DEPARTMENT in its contractual capacity, acts of another contractor in the performance of a contract with the DEPARTMENT, floods, fires, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather and delays of Subcontractors or Suppliers due to such causes. Any delay in receipt of materials on the site, caused by other than one of the specifically mentioned occurrences above, does not of itself justify a time extension, provided that the CONTRACTOR shall within twenty four (24) hours from the beginning of any such delay (unless the Contracting Officer shall grant a further period of the time prior to the date of final settlement of the Contract), notify the Contracting Officer in writing of the cause of delay. The Contracting Officer shall ascertain the facts and the extent of the delay and extend the time for completing the Work when the findings of fact justify such an extension.

#### **11.6 Essence of Contract:**

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

#### **11.7 Reasonable Completion Time:**

It is expressly understood and agreed by and between the CONTRACTOR and the DEPARTMENT that the date of beginning and the time for Final Completion of the Work described herein are reasonable times for the completion of the Work.

#### **11.8 Delay Damages:**

Whether or not the CONTRACTOR's right to proceed with the Work is terminated, he and his Sureties shall be liable for damages resulting from his refusal or failure to complete the Work within the specified time.

Liquidated and actual damages for delay shall be paid by the CONTRACTOR or his Surety to the DEPARTMENT in the amount as specified in the Supplementary Conditions for each Calendar Day the completion of the Work or any part thereof is delayed beyond the time required by the Contract, or any extension thereof. If a listing of incidents resulting from a delay and expected to give rise to actual or liquidated damages is not established by the Contract Documents, then the CONTRACTOR and his Surety shall be liable to the DEPARTMENT for any actual damages occasioned by such delay. The CONTRACTOR acknowledges that the liquidated damages established herein are not a penalty but rather constitute an estimate of damages that the DEPARTMENT will sustain by reason of delayed completion. These liquidated and actual damages are intended as compensation for losses anticipated to arise, and include those items enumerated in the Supplementary Conditions.

These damages will continue to run both before and after termination in the event of default termination. These liquidated damages do not cover excess costs of completion or DEPARTMENT costs, fees, and charges related to reprourement. If a default termination occurs, the CONTRACTOR or his Surety shall pay in addition to these damages, all excess costs and expenses related to completion as provided by Article 14.2.5.

### **ARTICLE 12 - QUALITY ASSURANCE**

#### **12.1 Warranty and Guaranty:**

The CONTRACTOR warrants and guarantees to the DEPARTMENT that all Work will be in accordance with the Contract Documents and will not be Defective. Prompt notice of all defects shall be given to the CONTRACTOR. All Defective Work, whether or not in place, may be rejected, corrected or accepted as provided for in this article.

#### **12.2 Access to Work:**



The DEPARTMENT and the DEPARTMENT's representatives, testing agencies and governmental agencies with jurisdiction interests will have access to the Work at reasonable times for their observation, inspecting and testing. The CONTRACTOR shall provide proper and safe conditions for such access.

### **12.3 Tests and Inspections:**

- 12.3.1 The CONTRACTOR shall give the Contracting Officer timely notice of readiness of the Work for all required inspections, tests or Approvals.
- 12.3.2 If Regulatory Requirements of any public body having jurisdiction require any Work (or part thereof) to specifically be inspected, tested or approved, the CONTRACTOR shall assume full responsibility therefor, pay all costs in connection therewith and furnish the Contracting Officer the required certificates of inspection, testing or approval. The CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with DEPARTMENT's acceptance of a Supplier of materials or equipment proposed to be incorporated in the Work, or of materials or equipment submitted for Approval 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 CONTRACTOR. The DEPARTMENT may perform additional tests and inspections which it deems necessary to insure quality control. All such failed tests or inspections shall be at the CONTRACTOR's expense.
- 12.3.4 If any Work (including the work of others) that is to be inspected, tested or Approved is covered without written concurrence of the Contracting Officer, it must, if requested by the Contracting Officer, be uncovered for observation. Such uncovering shall be at the CONTRACTOR's expense unless the CONTRACTOR has given the Contracting Officer timely notice of CONTRACTOR's intention to cover the same and the Contracting Officer has not acted with reasonable promptness in response to such notice.
- 12.3.5 Neither observations nor inspections, tests or Approvals by the DEPARTMENT or others shall relieve the CONTRACTOR from the CONTRACTOR's obligations to perform the Work in accordance with the Contract Documents.

### **12.4 Uncovering Work:**

- 12.4.1 If any Work is covered contrary to the written request of the Contracting Officer, it must, if requested by the Contracting Officer, be uncovered for the Contracting Officer's observation and replaced at the CONTRACTOR's expense.
- 12.4.2 If the Contracting Officer considers it necessary or advisable that covered Work be observed inspected or tested, the CONTRACTOR, at the Contracting Officer's request, shall uncover, expose or otherwise make available for observation, inspection or testing as the Contracting Officer 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 of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) and the DEPARTMENT shall be entitled to an appropriate decrease in the Contract Price. If, however, 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.

### **12.5 DEPARTMENT May Stop the Work:**

If the Work is Defective, or the CONTRACTOR fails to supply suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, the Contracting Officer 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 Contracting Officer to stop the Work shall not give rise to any duty on the part of the Contracting Officer to exercise this right for the benefit of the CONTRACTOR or any other party.

### **12.6 Correction or Removal of Defective Work:**

If required by the Contracting Officer, the CONTRACTOR shall promptly, as directed, either correct all Defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by the Contracting Officer, remove it from the site and replace it with Work which conforms to the requirements of the Contract Documents. The CONTRACTOR shall bear all direct, indirect and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

#### **12.7 One Year Correction Period:**

If within one year after the date of Final Completion or such longer period of time as may be prescribed by Regulatory Requirements or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be Defective, the CONTRACTOR shall promptly, without cost to the DEPARTMENT and in accordance with the Contracting Officer's written instructions, either correct such Defective Work, or, if it has been rejected by the Contracting Officer, remove it from the site and replace it with conforming Work. If the CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, the DEPARTMENT may have the Defective Work corrected or the rejected Work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by the CONTRACTOR. In special circumstances where a particular item of equipment is placed in continuous service for the benefit of the DEPARTMENT before Substantial Completion of all the Work, the correction period for that item may begin on an earlier date if so provided in the Specifications or by Change Order. Provisions of this paragraph are not intended to shorten the statute of limitations for bringing an action.

#### **12.8 Acceptance of Defective Work:**

Instead of requiring correction or removal and replacement of Defective Work, the Contracting Officer may accept Defective Work, the CONTRACTOR shall bear all direct, indirect and consequential costs attributable to the Contracting Officer's evaluation of and determination to accept such Defective Work (costs to include but not be limited to fees and charges of engineers, architects, attorneys and other professionals). 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 DEPARTMENT shall be entitled to an appropriate decrease in the Contract Price. If the DEPARTMENT has already made final payment to the CONTRACTOR, an appropriate amount shall be paid by the CONTRACTOR or his Surety to the DEPARTMENT.

#### **12.9 DEPARTMENT May Correct Defective Work:**

If the CONTRACTOR fails within a reasonable time after written notice from the Contracting Officer to proceed to correct Defective Work or to remove and replace rejected Work as required by the Contracting Officer in accordance with paragraph 12.6, or if the CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if the CONTRACTOR fails to comply with any other provision of the Contract Documents, the DEPARTMENT may, after 7 days' written notice to the CONTRACTOR, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph the DEPARTMENT shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, the Contracting Officer may exclude the CONTRACTOR from all or part of the site, take possession of all or part of the Work, and suspend the CONTRACTOR's services related thereto, take possession of the CONTRACTOR's tools, appliances, construction equipment and machinery at the site and incorporate in the Work all materials and equipment stored at the site or approved remote storage sites or for which the DEPARTMENT has paid the CONTRACTOR but which are stored elsewhere. The CONTRACTOR shall allow the Contracting Officer and his authorized representatives such access to the site as may be necessary to enable the Contracting Officer to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of the DEPARTMENT in exercising such rights and remedies will be charged against the CONTRACTOR, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and the DEPARTMENT shall be entitled to an appropriate decrease in the Contract Price. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court and arbitration costs and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of the CONTRACTOR's Defective Work. The CONTRACTOR shall not be allowed an extension of time because of

any delay in performance of the work attributable to the exercise, by the Contracting Officer, of the DEPARTMENT's rights and remedies hereunder.

## **ARTICLE 13 - PAYMENTS TO CONTRACTOR AND COMPLETION**

### **13.1 Schedule of Values:**

The Schedule of Values established as provided in paragraph 6.6 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to the Contracting Officer. Progress payments on account of Unit Price Work will be based on the number of units completed.

### **13.2 Preliminary Payments:**

Upon approval of the Schedule of Values the CONTRACTOR may be paid for direct costs substantiated by paid invoices and other prerequisite documents required by the General Requirements. Direct costs shall include the cost of bonds, insurance, approved materials stored on the site or at approved remote storage sites, deposits required by a Supplier prior to fabricating materials, and other approved direct mobilization costs substantiated as indicated above. These payments shall be included as a part of the total Contract Price as stated in the Contract.

### **13.3 Application for Progress Payment:**

The CONTRACTOR shall submit to the Contracting Officer for review an Application for Payment filled out and signed by the CONTRACTOR covering the Work completed as of the date of the Application for Payment and accompanied by such supporting documentation as is required by the Contract Documents. Progress payments will be made as the Work progresses on a monthly basis or twice a month when requested by the CONTRACTOR, but only when the approved invoice exceeds \$10,000.00.

### **13.4 Review of Applications for Progress Payment:**

Contracting Officer will either indicate in writing a recommendation of payment or return the Application for Payment to the CONTRACTOR indicating in writing the Contracting Officer's reasons for refusing to recommend payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the Application for Payment.

### **13.5 Stored Materials and Equipment:**

If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, paid invoice or other documentation warranting that the DEPARTMENT has received the materials and equipment free and clear of all charges, security interests and encumbrances and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect the DEPARTMENT's interest therein, all of which will be satisfactory to the Contracting Officer. No payment will be made for perishable materials that could be rendered useless because of long storage periods. No progress payment will be made for living plant materials until planted.

### **13.6 CONTRACTOR's Warranty of Title:**

The CONTRACTOR warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to the DEPARTMENT no later than the time of payment free and clear of any claims, liens, security interests and further obligations.

### **13.7 Withholding of Payments:**

The DEPARTMENT may withhold or refuse payment for any of the reasons listed below provided it gives written notice of its intent to withhold and of the basis for withholding:

- 13.7.1 The Work is Defective, or completed Work has been damaged requiring correction or replacement, or has been installed without Approval of Shop Drawings, or by an unapproved Subcontractor, or for unsuitable storage of materials and equipment.
- 13.7.2 The Contract Price has been reduced by Change Order,

- 13.7.3 The DEPARTMENT has been required to correct Defective Work or complete Work in accordance with paragraph 12.9.
- 13.7.4 The DEPARTMENT's actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.2.1.a through 14.2.1.k inclusive.
- 13.7.5 Claims have been made against the DEPARTMENT or against the funds held by the DEPARTMENT on account of the CONTRACTOR's actions or inactions in performing this Contract, or there are other items entitling the DEPARTMENT to a set off.
- 13.7.6 Subsequently discovered evidence or the results of subsequent inspections or test, nullify any previous payments for reasons stated in subparagraphs 13.7.1 through 13.7.5.
- 13.7.7 The CONTRACTOR has failed to fulfill or is in violation of any of his obligations under any provision of this Contract.

**13.8 Retainage:**

At any time the DEPARTMENT finds that satisfactory progress is not being made it may in addition to the amounts withheld under 13.7 retain a maximum amount equal to 10% of the total amount earned on all subsequent progress payments. This retainage may be released at such time as the Contracting Officer finds that satisfactory progress is being made.

**13.9 Request for Release of Funds:**

If the CONTRACTOR believes the basis for withholding is invalid or no longer exists, immediate written notice of the facts and Contract provisions on which the CONTRACTOR relies, shall be given to the DEPARTMENT, together with a request for release of funds and adequate documentary evidence proving that the problem has been cured. In the case of withholding which has occurred at the request of the Department of Labor, the CONTRACTOR shall provide a letter from the Department of Labor stating that withholding is no longer requested. Following such a submittal by the CONTRACTOR, the DEPARTMENT shall have a reasonable time to investigate and verify the facts and seek additional assurances before determining whether release of withheld payments is justified.

**13.10 Substantial Completion:**

When the CONTRACTOR considers the Work ready for its intended use the CONTRACTOR shall notify the Contracting Officer in writing that the Work or a portion of Work which has been specifically identified in the Contract Documents is substantially complete (except for items specifically listed by the CONTRACTOR as incomplete) and request that the DEPARTMENT issue a certificate of Substantial Completion. Within a reasonable time thereafter, the Contracting Officer, the CONTRACTOR and appropriate Consultant(s) shall make an inspection of the Work to determine the status of completion. If the Contracting Officer does not consider the Work substantially complete, the Contracting Officer will notify the CONTRACTOR in writing giving the reasons therefor. If the Contracting Officer considers the Work substantially complete, the Contracting Officer will within fourteen days execute and deliver to the CONTRACTOR a certificate of Substantial Completion with tentative list of items to be completed or corrected. At the time of delivery of the certificate of Substantial Completion the Contracting Officer will deliver to the CONTRACTOR a written division of responsibilities pending Final Completion with respect to security, operation, safety, maintenance, heat, utilities, insurance and warranties which shall be consistent with the terms of the Contract Documents.

The DEPARTMENT shall be responsible for all DEPARTMENT costs resulting from the initial inspection and the first re-inspection, the CONTRACTOR shall pay all costs incurred by the DEPARTMENT resulting from re-inspections, thereafter.

**13.11 Access Following Substantial Completion:**

The DEPARTMENT shall have the right to exclude the CONTRACTOR from the Work after the date of Substantial Completion, but the DEPARTMENT shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

**13.12 Final Inspection:**

Upon written notice from the CONTRACTOR that the entire Work or an agreed portion thereof is complete, the Contracting Officer will make a final inspection with the CONTRACTOR and appropriate Consultant(s) and will notify the CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or Defective. The CONTRACTOR shall immediately take such measures as are necessary to remedy such deficiencies. The CONTRACTOR shall pay for all costs incurred by the DEPARTMENT resulting from re-inspections.

**13.13 Final Completion and Application for Payment:**

After the CONTRACTOR has completed all such corrections to the satisfaction of the Contracting Officer and delivered all maintenance and operating instructions, schedules, guarantees, bonds, certificates of payment to all laborers, Subcontractors and Suppliers, certificates of inspection, marked-up record documents and other documents - all as required by the Contract Documents; and after the Contracting Officer has indicated in writing that the Work has met the requirements for Final Completion, and subject to the provisions of paragraph 13.18, the CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all remaining certificates, warranties, guarantees, releases, affidavits, and other documentation required by the Contract Documents.

**13.14 Final Payment:**

- 13.14.1 If on the basis of the Contracting Officer's observation of the Work during construction and final inspection, and the Contracting Officer's review of the final Application for Payment and accompanying documentation - all as required by the Contract Documents; and the Contracting Officer is satisfied that the Work has been completed and the CONTRACTOR's other obligations under the Contract Documents have been fulfilled, the DEPARTMENT will process final Application for Payment. Otherwise, the Contracting Officer will return the Application for Payment to the CONTRACTOR, indicating in writing the reasons for refusing to process final payment, in which case the CONTRACTOR shall make the necessary corrections and resubmit the final Application for Payment.
- 13.14.2 If, through no fault of the CONTRACTOR, Final Completion of the Work is significantly delayed, the Contracting Officer shall, upon receipt of the CONTRACTOR's final Application for Payment, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by the DEPARTMENT for Work not fully completed or corrected is less than the retainage provided for in paragraph 13.9, and if bonds have been furnished as required in paragraph 5.1, the written consent of the Surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the CONTRACTOR to the DEPARTMENT with the application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

**13.15 Final Acceptance:**

Following certification of payment of payroll and revenue taxes, and final payment to the CONTRACTOR, the DEPARTMENT will issue a letter of Final Acceptance, releasing the CONTRACTOR from further obligations under the Contract, except as provided in paragraph 13.17.

**13.16 CONTRACTOR's Continuing Obligation:**

The CONTRACTOR's obligation to perform and complete the Work and pay all laborers, Subcontractors, and materialmen in accordance with the Contract Documents shall be absolute. Neither any progress or final payment by the DEPARTMENT, nor the issuance of a certificate of Substantial Completion, nor any use or occupancy of the Work or any part thereof by the DEPARTMENT or Using Agency, nor any act of acceptance by the DEPARTMENT nor any failure to do so, nor any review and Approval of a Shop Drawing or sample submission, nor any correction of Defective Work by the DEPARTMENT 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.

**13.17 Waiver of Claims by CONTRACTOR:**

The making and acceptance of final payment will constitute a waiver of all claims by the CONTRACTOR against the DEPARTMENT other than those previously made in writing and still unsettled.

**13.18 No Waiver of Legal Rights:**

The DEPARTMENT shall not be precluded or be estopped by any payment, measurement, estimate, or certificate made either before or after the completion and acceptance of the Work and payment therefor, from showing the true amount and character of the Work performed and materials furnished by the CONTRACTOR, nor from showing that any payment, measurement, estimate or certificate is untrue or is incorrectly made, or that the Work or materials are Defective. The DEPARTMENT shall not be precluded or estopped, notwithstanding any such measurement, estimate, or certificate and payment in accordance therewith, from recovering from the CONTRACTOR or his Sureties, or both, such damages as it may sustain by reason of his failure to comply with requirements of the Contract Documents. Neither the acceptance by the DEPARTMENT, or any representative of the DEPARTMENT, nor any payment for or acceptance of the whole or any part of the Work, nor any extension of the Contract Time, nor any possession taken by the DEPARTMENT, shall operate as a waiver of any portion of the Contract or of any power herein reserved, or of any right to damages. A waiver by the DEPARTMENT of any breach of the Contract shall not be held to be a waiver of any other subsequent breach.

**ARTICLE 14 - SUSPENSION OF WORK, DEFAULT AND TERMINATION**

**14.1 DEPARTMENT May Suspend Work:**

- 14.1.1 The DEPARTMENT may, at any time, suspend the Work or any portion thereof by notice in writing to the CONTRACTOR. If the Work is suspended without cause 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 Article 15. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that suspension is due to the fault or negligence of the CONTRACTOR, or that suspension is necessary for Contract compliance, or that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the CONTRACTOR.
- 14.1.2 In case of suspension of Work, the CONTRACTOR shall be responsible for preventing damage to or loss of any of the Work already performed and of all materials whether stored on or off the site or Approved remote storage sites.

**14.2 Default of Contract:**

- 14.2.1 If the CONTRACTOR:
- a. Fails to begin the Work under the Contract within the time specified in the Proposal, or
  - b. Fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficiently skilled workmen, suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 6.6 as revised from time to time), or
  - c. Performs the Work unsuitably or neglects or refuses to remove materials or to correct Defective Work, or
  - d. Discontinues the prosecution of the Work, or
  - e. Fails to resume Work which has been discontinued within a reasonable time after notice to do so, or
  - f. Becomes insolvent, except that if the CONTRACTOR declares bankruptcy termination in accordance with all *U.S.C. 362* and/or *11 U.S.C. 365*. In the event the CONTRACTOR declares bankruptcy the CONTRACTOR agrees that the Contract will be assumed or rejected in a timely manner so that the Contract will be completed by the date specified in the Contract Documents, or

- g. Allows any final judgment to stand against him unsatisfied for period of 60 days, or
  - h. Makes an assignment for the benefit of creditors without the consent of the Contracting Officer, or
  - i. Disregards Regulatory Requirements of any public body having jurisdiction, or
  - j. Otherwise violates in any substantial way any provisions of the Contract Documents, or
  - k. For any cause whatsoever, fails to carry on the Work in an acceptable manner, the Contracting Officer may give notice in writing to the CONTRACTOR and his Surety of such delay, neglect, or default.
- 14.2.2 If the CONTRACTOR or Surety, within the time specified in the above notice of default, shall not proceed in accordance therewith, then the DEPARTMENT may, upon written notification from the Contracting Officer of the fact of such delay, neglect or default and the CONTRACTOR's failure to comply with such notice, have full power and authority without violating the Contract, to take the prosecution of the Work out of the hands of the CONTRACTOR. The DEPARTMENT may terminate the services of the CONTRACTOR, exclude the CONTRACTOR from the site and take possession of the Work and of all the CONTRACTOR's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by the CONTRACTOR (without liability to the CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which the DEPARTMENT has paid the CONTRACTOR but which are stored elsewhere, and finish the Work as the DEPARTMENT may deem expedient. The DEPARTMENT may enter into an agreement for the completion of said Contract according to the terms and provisions thereof, or use such other methods that in the opinion of the Contracting Officer are required for the completion of said Contract in an acceptable manner.
- 14.2.3 The Contracting Officer may, by written notice to the CONTRACTOR and his Surety or his representative, transfer the employment of the Work from the CONTRACTOR to the Surety, or if the CONTRACTOR abandons the Work undertaken under the Contract, the Contracting Officer may, at his option with written notice to the Surety and without any written notice to the CONTRACTOR, transfer the employment for said Work directly to the Surety. The Surety shall submit its plan for completion of the Work, including any contracts or agreements with third parties for such completion, to the DEPARTMENT for Approval prior to beginning completion of the Work. Approval of such contracts shall be in accordance with all applicable requirements and procedures for Approval of subcontracts as stated in the Contract Documents.
- 14.2.4 Upon receipt of the notice terminating the services of the CONTRACTOR, the Surety shall enter upon the premises and take possession of all materials, tools, and appliances thereon for the purpose of completing the Work included under the Contract and employ by contract or otherwise any person or persons to finish the Work and provide the materials therefor, without termination of the continuing full force and effect of this Contract. In case of such transfer of employment to the Surety, the Surety shall be paid in its own name on estimates covering Work subsequently performed under the terms of the Contract and according to the terms thereof without any right of the CONTRACTOR to make any claim for the same or any part thereof.
- 14.2.5 If the Contract is terminated for default, the CONTRACTOR and the Surety shall be jointly and severally liable for damages for delay as provided by paragraph 11.8, and for the excess cost of completion, and all costs and expenses incurred by the DEPARTMENT in completing the Work or arranging for completion of the Work, including but not limited to costs of assessing the Work to be done, costs associated with advertising, soliciting or negotiating for bids or proposals for completion, and other procurement costs. Following termination the CONTRACTOR shall not be entitled to receive any further balance of the amount to be paid under the Contract until the Work is fully finished and accepted, at which time if the unpaid balance exceeds the amount due the DEPARTMENT and any amounts due to persons for whose benefit the DEPARTMENT has withheld funds, such excess shall be paid by the DEPARTMENT to the CONTRACTOR. If the damages, costs, and expenses due the DEPARTMENT exceed the unpaid balance, the CONTRACTOR and his Surety shall pay the difference.
- 14.2.6 If, after notice of termination of the CONTRACTOR's right to proceed under the provisions of this clause, it is determined for any reason that the CONTRACTOR was not in default under the provisions of this

clause, or that the delay was excusable under the provisions of this clause, or that termination was wrongful, the rights and obligations of the parties shall be determined in accordance with the clause providing for convenience termination.

#### **14.3 Rights or Remedies:**

Where the CONTRACTOR's services have been so terminated by the DEPARTMENT, the termination will not affect any rights or remedies of the DEPARTMENT against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due the CONTRACTOR by the DEPARTMENT will not release the CONTRACTOR from liability.

#### **14.4 Convenience Termination:**

- 14.4.1 The performance of the Work may be terminated by the DEPARTMENT in accordance with this section in whole or in part, whenever, for any reason the Contracting Officer shall determine that such termination is in the best interest of the DEPARTMENT. Any such termination shall be effected by delivery to the CONTRACTOR of a *Notice of Termination*, specifying termination is for the convenience of the DEPARTMENT the extent to which performance of Work is terminated, and the date upon which such termination becomes effective.

Immediately upon receipt of a *Notice of Termination* and except as otherwise directed by the Contracting Officer, the CONTRACTOR shall:

- a. Stop Work on the date and to the extent specified in the *Notice of Termination*;
- b. Place no further orders or subcontracts for materials, services, or facilities except as may be necessary for completion of such portion of the Work as is not terminated;
- c. Terminate all orders and subcontracts to the extent that they relate to the performance of Work terminated by the *Notice of Termination*;
- d. With the written Approval of the Contracting Officer, to the extent he may require, settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, the cost of which would be reimbursable, in whole, or in part, in accordance with the provisions of the Contract;
- e. Submit to the Contracting Officer a list, certified as to quantity and quality, of any or all items of termination inventory exclusive of items the disposition of which had been directed or authorized by the Contracting Officer;
- f. Transfer to the Contracting Officer the completed or partially completed record drawings, Shop Drawings, information, and other property which, if the Contract had been completed, would be required to be furnished to the DEPARTMENT;
- g. Take such action as may be necessary, or as the Contracting Officer may direct, for the protection and preservation of the property related to the Contract which is in the possession of the CONTRACTOR and in which the DEPARTMENT has or may acquire any interest.

The CONTRACTOR shall proceed immediately with the performance of the above obligations.

- 14.4.2 When the DEPARTMENT orders termination of the Work effective on a certain date, all Work in place as of that date will be paid for in accordance with Article 13 of the Contract. Materials required for completion and on hand but not incorporated in the Work will be paid for at invoice cost plus 15 % with materials becoming the property of the DEPARTMENT - or the CONTRACTOR may retain title to the materials and be paid an agreed upon lump sum. Materials on order shall be cancelled, and the DEPARTMENT shall pay reasonable factory cancellation charges with the option of taking delivery of the materials in lieu of payment of cancellation charges. The CONTRACTOR shall be paid 10% of the cost, freight not included, of materials cancelled, and direct expenses only for CONTRACTOR chartered freight transport which cannot be cancelled without charges, to the extent that the CONTRACTOR can establish them. The extra costs due to cancellation of bonds and insurance and that part of job start-up and phase-out costs not amortized by the amount of Work accomplished shall be paid by the DEPARTMENT. Charges for loss of profit or consequential damages shall not be recoverable except as provided above.



- 14.4.3 The termination claim shall be submitted promptly, but in no event later than 90 days from the effective date of termination, unless extensions in writing are granted by the Contracting Officer upon written request of the CONTRACTOR made within the 90 day period. Upon failure of the CONTRACTOR to submit his termination claim within the time allowed, the Contracting Officer may determine, on the basis of information available to him, the amount, if any, due to the CONTRACTOR by reason of the termination and shall thereupon pay to the CONTRACTOR the amount so determined.
- 14.4.4 The CONTRACTOR and the Contracting Officer may agree upon whole or any part of the amount or amounts to be paid to the CONTRACTOR by reason of the total or partial termination of Work pursuant to this section. The Contract shall be amended accordingly, and the CONTRACTOR shall be paid the agreed amount.

In the event of the failure of the CONTRACTOR and the Contracting Officer to agree in whole or in part, as provided heretofore, as to the amounts with respect to costs to be paid to the CONTRACTOR in connection with the termination of the Work the Contracting Officer shall determine, on the basis of information available to him, the amount, if any, due to the CONTRACTOR by reason of the termination and shall pay to the CONTRACTOR the amount determined as follows:

- a. All costs and expenses reimbursable in accordance with the Contract not previously paid to the CONTRACTOR for the performance of the Work prior to the effective date of the *Notice of Termination*;
  - b. So far as not included under "a" above, the cost of settling and paying claims arising out of the termination of the Work under subcontracts or orders which are properly chargeable to the terminated portions of the Contract;
  - c. The reasonable costs of settlement with respect to the terminated portion of the Contract heretofore, to the extent that these costs have not been covered under the payment provisions of the Contract.
- 14.4.5 The CONTRACTOR shall have the right of appeal under the DEPARTMENT's claim procedures, as defined in Article 15, for any determination made by the Contracting Officer, except if the CONTRACTOR has failed to submit his claim within the time provided and has failed to request extension of such time, CONTRACTOR shall have no such right of appeal.

In arriving at the amount due the CONTRACTOR under this section, there shall be deducted:

- a. All previous payments made to the CONTRACTOR for the performance of Work under the Contract prior to termination;
  - b. Any claim for which the DEPARTMENT may have against the CONTRACTOR;
  - c. The agreed price for, or the proceeds of sale of, any materials, supplies, or other things acquired by the CONTRACTOR or sold pursuant to the provisions of this section and not otherwise recovered by or credited to the DEPARTMENT; and,
  - d. All progress payments made to the CONTRACTOR under the provisions of this section.
- 14.4.6 Where the Work has been terminated by the DEPARTMENT said termination shall not affect or terminate any of the rights of the DEPARTMENT against the CONTRACTOR or his Surety then existing or which may thereafter accrue because of such default. Any retention or payment of monies by the DEPARTMENT due to the CONTRACTOR under the terms of the Contract shall not release the CONTRACTOR or his Surety from liability.

Unless otherwise provided for in the Contract Documents, or by applicable statute, the CONTRACTOR, from the effective date of termination and for a period of three years after final settlement under this Contract, shall preserve and make available to the DEPARTMENT at all reasonable times at the office of the CONTRACTOR, all its books, records, documents, and other evidence bearing on the cost and expenses of the CONTRACTOR under his Contract and relating to the Work terminated hereunder.

## **ARTICLE 15 - CLAIMS AND DISPUTES**

### **15.1 Notification:**

In addition to the notice requirements set out elsewhere in this Contract, if the CONTRACTOR becomes aware of any act or occurrence which may form the basis of a claim by the CONTRACTOR for additional compensation or an extension of time for performance, or if any dispute arises regarding a question of fact or interpretation of the Contract, the CONTRACTOR shall immediately inform the Project Manager. If the matter cannot be resolved by agreement within 7 days, the CONTRACTOR shall, within the next 14 days, submit an "Intent to Claim" in writing to the Project Manager.

The claim, if not resolved, shall be presented to the Project Manager, in writing, within 60 days following receipt of the "Intent to Claim". Receipt of the claim will be acknowledged in writing by the Project Manager.

The CONTRACTOR agrees that unless these written notices are provided, the CONTRACTOR will have no entitlement to additional time or compensation for such act, event or condition. The CONTRACTOR shall in any case continue diligent performance of the Contract.

### **15.2 Presenting Claim:**

The claim shall specifically include the following:

- 15.2.1 The act, event or condition giving rise to the claim.
- 15.2.2 The Contract provisions which apply to the claim and under which relief is provided.
- 15.2.3 The item or items of Contract Work affected and how they are affected.
- 15.2.4 The specific relief requested, including Contract Time if applicable, and the basis upon which it was calculated.

### **15.3 Claim Validity, Additional Information, and Project Manager's Actions:**

The claim, in order to be valid, must not only show that the CONTRACTOR suffered damages or delay but that those conditions were actually a result of the act, event or condition complained of and that the Contract provides entitlement to relief to the CONTRACTOR for such act, event, or condition. The Project Manager reserves the right to make written request to the CONTRACTOR at any time for additional information which the CONTRACTOR may possess relative to the claim. The CONTRACTOR agrees to provide the Project Manager such additional information within 30 days of receipt of such a request. Failure to furnish such additional information may be regarded as a waiver of the claim. The Claim, if not resolved by agreement within 60 days of its receipt, will automatically be forwarded to the Contracting Officer for formal written decision.

### **15.4 Contracting Officer's Decision:**

The CONTRACTOR will be furnished the Contracting Officers decision within the next 90 days, unless additional information is requested by the Contracting Officer. The Contracting Officer's decision is final and conclusive unless fraudulent as to the claim or unless, within 14 days of receipt of the decision, the CONTRACTOR delivers a written Notice of Appeal to the Appeals Officer. Procedures for appeals and hearings are covered under AS 36.30.625 and AS 36.30.630.

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**SECTION 00800**  
**SUPPLEMENTARY CONDITIONS**  
**MODIFICATIONS TO THE GENERAL CONDITIONS**  
**(STATE FUNDED CONTRACTS)**

The following supplements modify, change, delete from, add to the "General Conditions of the Construction Contract for Buildings", revised December, 1987 ( c ) 4/96. Where any article of the General Conditions is modified, or and Paragraph, Subparagraph, or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph, of Clause shall remain in effect.

**SC-1-DEFINITIONS**

At General Conditions Article 1, add the following definitions:

**“APPROVED.** ‘Approved’ or ‘Approval’ as used in this contract document shall mean that the Department has received a document, form or submittal from the contractor and that the Department has taken “No exceptions” to the item submitted. Unless the context clearly indicates otherwise, approved or approval shall not mean that the Department approves of the methods or means, or that the item or form submitted meets the requirements of the contract or constitutes acceptance of the Contractor’s work. Where approved or approval means acceptance, then such approval must be set forth in writing and signed by the contracting officer or his designee.

**ARCHITECT.** Where used in the contract documents, “ARCHITECT” shall mean the DEPARTMENT’S ENGINEER.

**ARCHITECT/ENGINEER.** Where used in the contract documents, “ARCHITECT/ENGINEER” shall mean the DEPARTMENT’S ENGINEER.

**ENGINEER.** The DEPARTMENT’S authorized representative of the Contracting Officer, as defined in the DEPARTMENT’S *delegation of authority letter* to be issued after notice-to-proceed, who is responsible for administration of the contract.

**EQUIPMENT.** All machinery together with the necessary supplies for upkeep and maintenance, and also tools and apparatus necessary for the proper construction and acceptable completion of the work.

**FURNISH.** To procure, transport, and deliver to the project site materials, labor, or equipment, for installation or use on the project.

**INSPECTOR.** The Engineer’s authorized representative assigned to make detailed observations relating to contract performance.

**INTERIM WORK AUTHORIZATION.** A written order by the Engineer initiating changes to the Contract, within its general scope, until a subsequent Change Order is executed.

**LABORATORY.** The official testing laboratories of the DEPARTMENT or such other laboratories as may be designated by the Engineer or identified in the contract documents.

**MATERIALS.** Any substances specified for use in the construction of the project.

**PRECONSTRUCTION CONFERENCE.** A meeting between the CONTRACTOR and the Engineer, and other parties affected by the construction, to discuss the project before the CONTRACTOR begins work.

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**QUALITY ASSURANCE (QA).** Where referred to in the technical specifications (Divisions 2 through 16), Quality Assurance refers to measures to be provided by the CONTRACTOR as specified.

**QUALITY CONTROL (QC).** Tests and inspections by the CONTRACTOR to insure the acceptability of materials incorporated into the work. QC test reports are used as a basis upon which to determine whether the Work conforms to the requirements of the Contract Documents and to determine its acceptability for payment.

**TRAFFIC CONTROL PLAN (TCP).** A drawing of one or more specific plans that detail the routing of pedestrian, and/or vehicular traffic through or around a construction area.

**UTILITY.** The privately, publicly or cooperatively owned lines, facilities and systems for producing, transmitting or distributing communications, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, storm water not connected with highway or street drainage, and other similar commodities, including publicly owned fire and police signal systems, street lighting systems, and railroads which directly or indirectly serve the public or any part thereof. The term "utility" shall also mean the utility company, inclusive of any wholly owned or controlled subsidiary."

At General Conditions Article 1, definition of **Contract Time**, last sentence, Replace "...Final Completion..." with:

"...Substantial Completion..."

At General Conditions Article 1, definition of **Conditions of the Contract**: Delete the text of this definition in its entirety.

At General Conditions Article 1, definition of **Contract Time**: Delete the text of this definition and replace with the following:

"The number of Calendar Days following issuance of Notice-to-Proceed in which the project shall be rendered Substantially Complete, or if specified as a calendar date, the Substantial Completion date specified in the Contract Documents."

At General Conditions Article 1, definition of **Controlling Item**: Delete the text of this definition and replace with the following:

"Any feature of the Work on the critical path of a network schedule."

At General Conditions Article 1, definition of **Defective**: Delete the text of this definition and replace with the following:

"Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents."

At General Conditions Article 1, definition of **Effective Date of the Contract**: Delete the text of this definition in its entirety.

At General Conditions Article 1, definition **Shop Drawings**: Add the following text:

"Where used in the Contract Documents, "Shop Drawings" shall also mean "Submittals"."

At General Conditions Article 1, second paragraph: Delete this paragraph in its entirety and replace with the following:

"The titles and headings of the articles, sections, and subsections herein are intended for convenience of reference."

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At General Conditions Article 1, third paragraph starting with "Whenever used in the Specifications....", Delete this paragraph in its entirety.

At General Conditions Article 1, fourth paragraph, last sentence: Revise it to read as follows:

"Words defined in Article 1 are to be interpreted as defined."

## **SC-2.1-AUTHORITIES AND LIMITATIONS**

At General Conditions Article 2.1.1, delete this paragraph in its entirety and replace with the following:

"The Contracting Officer alone, shall have the power to bind the DEPARTMENT and to exercise the rights, responsibilities, authorities and functions vested in the Contracting Officer by the Contract Documents. The Contracting Officer shall have the right to designate in writing authorized representatives to act for him. Wherever any provision of the Contract Documents specifies an individual or organization, whether governmental or private, to perform any act on behalf of or in the interest of the DEPARTMENT that individual or organization shall be deemed to be the Contracting Officer's authorized representative under this Contract but only to the extent so specified. "

At General Conditions Article 2.1.4 starting with "The term of "Contracting Officer" when used...", delete this article in its entirety.

## **SC-2.4-VISITS TO SITE/PLACE OF BUSINESS**

At General Conditions Article 2.4, delete this article in its entirety.

## **SC-4.1-AVAILABILITY OF LANDS**

At General Conditions Article 4.1, add the following:

"The CONTRACTOR shall provide all waste and disposal areas, including disposal areas for hazardous or contaminated materials, at no additional cost to the DEPARTMENT."

## **SC-4.3-EXPLORATIONS AND REPORTS**

At General Conditions Article 4.3, add the following text:

"A copy of the geotechnical reports and addendum that were used in the preparation of these contract documents (See Section 00300 , Information Available to Bidders) is provided to all planholders listed with the DEPARTMENT as General Contractors, and is available to other planholders upon request. While referenced by or provided with the Contract Documents; the recommendations, engineering details, and other information contained in these reports of explorations shall not be construed to supercede or constitute conditions of the Contract Documents."

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## **SC-4.7-SURVEY CONTROL**

At General Conditions Article 4.7, delete the third sentence and substitute the following text:

"Copies of all survey notes shall be provided to the DEPARTMENT at an interval determined by the Project Manager. The Project Manager may request submission on a weekly or longer period at his discretion. Any variations between the Contract Documents and actual field conditions shall be identified in the survey notes."

## **SC-5.2-BONDS**

At General Condition Article 5.2, delete the second, third, fourth, fifth, and sixth paragraphs in their entirety.

## **SC-5.4.2-INSURANCE REQUIREMENTS, GENERAL**

At General Condition Article 5.4.2, revise the first sentence to read as follows:

"The CONTRACTOR shall maintain in force at all times during the performance of the work under this agreement the following policies and minimum limits of liability."

## **SC-5.4.2a-WORKMANS COMPENSATION INSURANCE**

At General Condition Article 5.4.2a, replace paragraph "a" in its entirety and replace it with the following:

- "a. Workers' Compensation Insurance: The Contractor shall provide and maintain, for all employees of the Contractor engaged in work under this contract, Workers' Compensation Insurance as required by AS 23.30.045. The Contractor shall be responsible for Workers' Compensation Insurance for any subcontractor who provides services under this contract, to include:
1. Waiver of subrogation against the State and Employer's Liability Protection in the amount of \$500,000 each accident/\$500,000 each disease.
  2. If the 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.
  3. Whenever the work involves activity on or about navigable waters, the Workers' Compensation policy shall contain a United States Longshoreman's and Harbor Worker's Act endorsement, and when appropriate, a Maritime Employer's Liability (Jones Act) endorsement with a minimum limit of \$1,000,000."

## **SC-5.4b-COMPREHENSIVE GENERAL LIABILITY INSURANCE**

At General Conditions Article 5.4b, delete minimum limits of liability items 1 and 2 in their entirety and substitute the following text:

- "1. If the CONTRACTOR carries a *Comprehensive General Liability* policy, the limits of liability shall not be less than a Combined Single Limit for bodily injury, property damage and Personal Injury Liability of:
- \$1,000,000 each occurrence  
\$2,000,00 aggregate
2. If the CONTRACTOR carries a *Commercial General Liability* policy, the limits of liability shall not be less than:

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\$1,000,000 each occurrence (Combined Single Limit for bodily injury and property damage)  
\$1,000,000 for Personal Injury Liability

\$2,000,000 aggregate for Products-Completed Operations  
\$2,000,000 general aggregate

The State of Alaska, DEPARTMENT of Health & Social Services shall be named as an "Additional Insured" under all liability coverages listed above."

### **SC-5.4.3-INSURANCE REQUIREMENTS, EVIDENCE OF INSURANCE**

At General Conditions Article 5.4.3, delete this subsection and replace with the following:

"In addition to providing the above coverages the Contractor shall, in any contract or agreement with subcontractors performing work, require that all indemnities and waivers of subrogation it obtains, and that any stipulation to be named as an additional insured it obtains, also be extended to waive rights of subrogation against the State of Alaska and to add the State of Alaska as additional named indemnitee and as additional insured.

Evidence of insurance shall be furnished to the Department prior to the award of the contract. Such evidence, executed by the carrier's representative and issued to the Department, shall consist of a certificate of insurance or the policy declaration page with required endorsements attached thereto which denote the type, amount, class of operations covered, effective (and retroactive) dates, and dates of expiration. Acceptance by the Department of deficient evidence does not constitute a waiver of contract requirements.

When a certificate of insurance is furnished, it shall contain the following statement:  
"This is to certify that the policies described herein comply with all aspects of the insurance requirements of (Project Name and Number)."

### **SC-6.6.1-PROGRESS SCHEDULE**

At General Condition Article 6.6.1, change the phrase "Within reasonable time prior to the Pre-Construction Conference..." to read:

"Within seven days after the Pre-Construction Conference."

### **SC-6.6.2-SCHEDULE OF SHOP DRAWINGS AND SCHEDULE OF VALUES**

At General Condition Article 6.6.2, change the phrase "Within fifteen days after the date of the Notice To Proceed,..." to read:

"Prior to submitting the CONTRACTOR's first Application for Payment..."

### **SC-6.9-SUBSTITUTES "OR EQUAL" ITEMS**

Add the following article:

"6.9.5 - Substitutions shall be permitted during or after the bid period as allowed and in accordance with Document 00020 - Invitation for Bids, Document 00700 – General Conditions, and Document 01630 - Product Options and Substitutions."

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### **SC-6.13.1-SUBCONTRACT PROVISIONS**

At General Condition Article 6.13.1, delete the third sentence and add the following text:

"All subcontracts shall contain provisions for prompt payment, release of retainage, and interest on late payment amounts and retainage as specified in A.S. 36.90.210. Contracts between subcontractors, regardless of tier, must also contain these provisions."

### **SC-6.27-LOAD RESTRICTIONS**

Add new General Conditions Article 6.27 as follows:

#### **"6.27 Load Restrictions**

The CONTRACTOR shall comply with all load restrictions as set forth in the "Administrative Permit Manual", and Title 17, Chapter 25, of the Alaska Administrative Code in the hauling of materials on public roads, beyond the limits of the project, and on all public roads within the project limits that are scheduled to remain in use upon completion of the project.

Overload permits may, at the discretion of the State, be issued for travel beyond the project limits for purposes of mobilization and/or demobilization. Issuance of such a permit will not relieve the CONTRACTOR of liability for damage which may result from the moving of equipment.

The operation of equipment of such weight or so loaded as to cause damage to any type of construction will not be permitted. No overloads will be permitted on the base course or surface course under construction. No loads will be permitted on a concrete pavement, base or structure before the expiration of the curing period. The CONTRACTOR shall be responsible for all damage done by his equipment."

### **SC-7.12-APPLICABLE ALASKA PREFERENCES**

At General Condition Article 7.12.2, delete the last portion of the first sentence commencing at the words, "...when the bid documents designate..." and replace with the words:

"...when the bidder designates the use of Alaska products. The Bidder shall complete the Alaska Products Preference Worksheet per its instructions and submit it with the Bid Proposal." Continue with existing second sentence.

### **SC-7.13-PREFERENTIAL EMPLOYMENT**

At General Condition Article 7.13, delete the text of this article in its entirety.

### **SC-7.14.1-CERTIFIED PAYROLLS**

At General Condition Article 7.14.1, add the following text:

"Regardless of project funding source, copies of all certified payrolls supplied to the State DEPARTMENT of Labor by the CONTRACTOR shall be supplied also to the Project Manager upon request, including submittals made by, or on behalf of, subcontractors."

Add General Condition Article 7.14.3, as follows:

"Within three calendar days of award of a construction contract, the CONTRACTOR shall file a "Notice of Work" with the Department of Labor and shall pay all related fees. The Contracting Officer will not issue Notice to Proceed to the CONTRACTOR until such notice and fees have been paid to



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the Department of Labor. Failure of the CONTRACTOR to file the Notice of Work and pay fees within this timeframe shall not constitute grounds for an extension of contract time or adjustment of contract price.”

### **SC-7.16-COVENANT AGAINST CONTINGENT FEES**

At General Conditions Article 7.16, delete the text of this article in its entirety.

### **SC-7.17-OFFICIALS NOT TO BENEFIT**

At General Conditions Article 7.17, delete the text of this article in its entirety.

### **SC-7.18-PERSONAL LIABILITY OF PUBLIC OFFICIALS**

At General Conditions Article 7.18, delete the text of this article in its entirety.

### **SC-9.4-CHANGE ORDER**

At General Conditions Article 9.4, change the first sentence to read:

“A change in Contract Time, Contract Price, or responsibility may be made for changes within the scope of the Work by Change Order.”

At General Conditions Article 9.4, add the following sentence:

”A Change Order shall be considered executed when it is signed by the DEPARTMENT.”

### **SC-9.10-INTERIM WORK AUTHORIZATION**

At General Conditions Article 9.10, add the following new paragraph:

#### **“9.10 Interim Work Authorization**

An Interim Work Authorization may be used to establish a change within the scope of the Work; however, only a Change Order shall establish associated changes in Contract Time and Price. Work authorized by Interim Work Authorization shall be converted to a Change Order. The basis of payment shall be as stated in the Interim Work Authorization, unless it states that the basis of payment has not been established and is to be negotiated, in which case the Cost of the Work shall be documented pursuant to Article 10.4, to establish a basis for negotiating a lump sum price for the Change Order.”

### **SC-10.3.2-CHANGE ORDER PRICE DETERMINATION FOR LUMP SUM CHANGE ORDERS**

At General Conditions Article 10.3.2, Delete this paragraph in its entirety and replace it with the following.

“10.3.2 By mutual acceptance of a lump sum price which includes overhead and profit. The following maximum rates of cost markup (to cover both overhead and profit of the CONTRACTOR) shall be used in the negotiation of a Lump Sum Change Order:

- a. 17% - where a cost is borne directly by prime contractor (first tier contractor).
- b. 10% - where a cost is borne by a subcontractor (lower tier contractor).

Where the cost is borne by a subcontractor acting as a first tier contractor, the allowable overhead and profit markup for lump sum change orders shall not exceed 17%. Any lower

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tier subcontractors, including the CONTRACTOR in this case, for whom the first tier subcontractor performs the work, shall be allowed an overhead and profit markup that does not exceed 10%.

#### **SC-10.4-COST OF THE WORK**

At General Conditions Article 10.4.1, replace the second sentence from the end of the paragraph with the following:

“Such employees shall include manual workers up through the level of foreman but shall not include general foremen, superintendents, and non-manual employees.”

At General Conditions Article 10.4.2, replace the first sentence with the following:

“Cost of all materials and equipment furnished and incorporated or consumed in the Work, including costs of transportation and storage thereof, and Suppliers’ field services required in connection therewith.”

#### **SC-10.4.5.c-COST OF THE WORK (SUPPLEMENTAL COSTS)**

At General Condition Article 10.4.5.c, add the following:

"For any machinery or special equipment (other than small tools) which has been authorized by the Project Manager, the CONTRACTOR shall receive the rental rates in the current edition and appropriate volume of the "Rental Rate Blue Book for Construction Equipment", published by Dataquest, Inc., 1290 Ridder Park Drive, San Jose, CA 95131. Hourly rental rates shall be determined as follows:

*The established hourly rental rate shall be equal to the adjusted monthly rate for the basic equipment plus the adjusted monthly rate for applicable attachments, both divided by 176, and multiplied by the area adjustment factor, plus the estimated hourly operating cost.*

The adjusted monthly rate is that resulting from application of the rate adjustment formula in order to eliminate replacement cost allowances in machine depreciation and contingency cost allowances.

Attachments shall not be included unless required for the time and materials work.

For equipment not listed in The Blue Book, the CONTRACTOR shall receive a rental rate as agreed upon before such work is begun. If agreement cannot be reached, the DEPARTMENT reserves the right to establish a rate based on similar equipment in the Blue Book or prevailing commercial rates in the area.

These rates shall apply for equipment used during the CONTRACTOR's regular shift of 10 hours per day. Where the equipment is used more than 10 hours per day, either on the CONTRACTOR's normal work or on time and materials, and either on single or multiple shifts, an overtime rate, computed as follows, shall apply:

*The hourly overtime rate shall be equal to the adjusted monthly rate for the basic equipment plus the adjusted monthly rate for applicable attachments, both divided by 352, and multiplied by the area adjustment factor, plus the estimated hourly operating cost.*

Equipment which must be rented or leased specifically for work required under this section shall be authorized in writing by the Project Manager. The CONTRACTOR shall be paid invoice price plus 15%.

When it is necessary to obtain equipment from sources beyond the project limits exclusively for time

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

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

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

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

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

## **SC-10.11-DISADVANTAGED BUSINESSS ENTERPRISE PROGRAM**

At General Conditions Article 10.11, Delete this paragraph in its entirety for this State Funded Contract.

## **SC-11.3-COMPUTATION OF CONTRACT TIME**

At General Condition Article 11.3.1, third sentence, change "...the date of Final Completion..." to:

"...the date of Substantial Completion..."

At General Condition Article 11.3.2, first sentence, change "...the date of Final Completion..." to:

"...the date of Substantial Completion."

Add General Condition Article 11.3.3, to state as follows:

" The Contract Time shall be as stated on form 25D-9, Proposal."

## **SC-11.8-DELAY DAMAGES**

At General Condition Article 11.8, add the following:

"For each calendar day that the work remains incomplete after the expiration of the Contract Time, liquidated damages in the amount of \$500 per calendar day shall be assessed to the CONTRACTOR. If no money is due the CONTRACTOR, the DEPARTMENT shall have the right to recover said sum from the CONTRACTOR, the surety or both. The amount of these deductions is to reimburse the DEPARTMENT for estimated liquidated damages incurred as a result of the CONTRACTOR's failure to complete the work within the time specified. As liquidated damages, such

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deductions are not to be considered as penalties.

Permitting the CONTRACTOR to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a waiver on the part of the DEPARTMENT of any of its rights under the Contract.”

### **SC 12-ONE YEAR CORRECTION PERIOD**

At General Condition Article 12.7, in the first sentence, change the phrase “ Final Completion” to:

“Substantial Completion of the relevant portion of the Work...”

### **SC 13.3–APPLICATION FOR PROGRESS PAYMENT**

At General Conditions Article 13.3, revise the last sentence to read as follows:

“Progress payments will be made as the Work progresses on a monthly basis.”

### **SC 13.13–FINAL COMPLETION AND APPLICATION FOR PAYMENT**

At General Conditions Article 13.13, first sentence, delete the following items:

“maintenance and operating instructions  
certificates of inspection  
marked up record documents”

The preceding items are some of the requirements for Substantial Completion, as addressed in Section 01701.

### **SC 13.16–CONTRACTOR’S CONTINUING OBLIGATION**

At General Condition Article 13.16, add the following paragraph:

“When it is anticipated that restarting, testing, adjusting, or balancing of systems will be required following Final Acceptance and said requirements are noted in Section(s) 01650, such Work shall constitute a continuing obligation under the Contract.”

### **SC 14.2–DEFAULT OF CONTRACT**

At General Conditions Article 4.2, delete this section in its entirety and replace with the following:

“14.2.1 The Contracting Officer may give the contractor and his surety a written Notice to Cure Default if the contractor:

- a. fails to begin work in the time specified,
- b. fails to use sufficient resources to assure prompt completion of the work,
- c. performs the work unsuitably or neglect or refuse to remove and replace rejected materials or work,
- d. stops work,
- e. fails to resume stopped work after receiving notice to do so,
- f. becomes insolvent (except that if you declare bankruptcy, termination will be under Title 11 US Code 362 and/or 365. Your bankruptcy does not relieve the surety of any obligations to assume the Contract and complete the work in a timely manner.
- g. Allows any final judgment to stand against him unsatisfied for period of 60 days, or

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- h. Makes an assignment for the benefit of creditors without the consent of the Contracting Officer, or
  - i. Disregards Regulatory Requirements of any public body having jurisdiction, or
  - j. Otherwise violates in any substantial way any provisions of the Contract Documents, or
  - k. fails to comply with Contract minimum wage payments or civil rights requirements, or
  - l. are party to fraud, deception, misrepresentation , or
  - m. for any cause whatsoever, fails to carry on the Work in an acceptable manner.
- 14.2.2 The Notice to Cure Default will detail the conditions determined to be in default, the time within which to cure the default and may, in the Contracting Officer's discretion, specify the actions necessary to cure the default. Failure to cure the delay, neglect or default within the time specified in the Contracting Officer's written notice to cure authorizes the Department to terminate the contract. The Contracting Officer may allow more time to cure than originally stated in the Notice to Cure Default if he deems it to be in the best interests of the Department. The Department will provide you and your surety with a written Notice of Default Termination that details the default and the failure to cure it.
- 14.2.3 If the CONTRACTOR or Surety, within the time specified in the above notice of default, shall not proceed in accordance therewith, then the DEPARTMENT may, upon written notification from the Contracting Officer of the fact of such delay, neglect or default and the CONTRACTOR's failure to comply with such notice, have full power and authority without violating the Contract, to take the prosecution of the Work out of the hands of the CONTRACTOR. The DEPARTMENT may terminate the services of the CONTRACTOR, exclude the CONTRACTOR from the site and take possession of the Work and of all the CONTRACTOR's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by the CONTRACTOR (without liability to the CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which the DEPARTMENT has paid the CONTRACTOR but which are stored elsewhere, and finish the Work as the DEPARTMENT may deem expedient. The DEPARTMENT may enter into an agreement for the completion of said Contract according to the terms and provisions thereof, or use such other methods that in the opinion of the Contracting Officer are required for the completion of said Contract in an acceptable manner.
- 14.2.4 The Contracting Officer may, by written notice to the CONTRACTOR and his Surety or his representative, transfer the employment of the Work from the CONTRACTOR to the Surety, or if the CONTRACTOR abandons the Work undertaken under the Contract, the Contracting Officer may, at his option with written notice to the Surety and without any written notice to the CONTRACTOR, transfer the employment for said Work directly to the Surety. The Surety shall submit its plan for completion of the Work, including any contracts or agreements with third parties for such completion, to the DEPARTMENT for Approval prior to beginning completion of the Work. Approval of such contracts shall be in accordance with all applicable requirements and procedures for Approval of subcontracts as stated in the Contract Documents.
- 14.2.5 After the notice of termination is issued, the Department may take over the work and complete it by contract or otherwise and may take possession of and use materials, appliances, equipment or plant on the work site necessary for completing the work.
- 14.2.6 Rather than taking over the work itself, the Department may transfer the obligation to perform the work from the contractor to your surety. The surety must submit its plan for completion of the work, including any contracts or agreements with third parties for completion, to the Department for approval prior to beginning work. The surety must follow the Contract requirements for approval of subcontracts, except that the limitation on percent of work subcontracted will not apply.
- 14.2.7 On receipt of the transfer notice, the surety must take possession of all materials, tools, and
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appliances at the work site, employ an appropriate work force, and complete the Contract work, as specified. The Contract specifications and requirements shall remain in effect. However the Department will make subsequent Contract payments directly to the Surety for work performed under the terms of the Contract. You forfeit any right to claim for the same work or any part thereof. You are not entitled to receive any further balance of the amount to be paid under the Contract.

- 14.2.8 Upon receipt of the notice terminating the services of the CONTRACTOR, the Surety shall enter upon the premises and take possession of all materials, tools, and appliances thereon for the purpose of completing the Work included under the Contract and employ by contract or otherwise any person or persons to finish the Work and provide the materials therefor, without termination of the continuing full force and effect of this Contract. In case of such transfer of employment to the Surety, the Surety shall be paid in its own name on estimates covering Work subsequently performed under the terms of the Contract and according to the terms thereof without any right of the CONTRACTOR to make any claim for the same or any part thereof.
- 14.2.9 If the Contract is terminated for default, the CONTRACTOR and the Surety shall be jointly and severally liable for damages for delay as provided by paragraph 11.8, and for the excess cost of completion, and all costs and expenses incurred by the DEPARTMENT in completing the Work or arranging for completion of the Work, including but not limited to costs of assessing the Work to be done, costs associated with advertising, soliciting or negotiating for bids or proposals for completion, and other procurement costs. Following termination the CONTRACTOR shall not be entitled to receive any further balance of the amount to be paid under the Contract until the Work is fully finished and accepted, at which time if the unpaid balance exceeds the amount due the DEPARTMENT and any amounts due to persons for whose benefit the DEPARTMENT has withheld funds, such excess shall be paid by the DEPARTMENT to the CONTRACTOR. If the damages, costs, and expenses due the DEPARTMENT exceed the unpaid balance, the CONTRACTOR and his Surety shall pay the difference.
- 14.2.10 If, after notice of termination of the CONTRACTOR's right to proceed under the provisions of this clause, it is determined for any reason that the CONTRACTOR was not in default under the provisions of this clause, or that the delay was excusable under the provisions of this clause, or that termination was wrongful, the rights and obligations of the parties shall be determined in accordance with the clause providing for convenience termination.

**14.3 Rights or Remedies:**

Where the CONTRACTOR's services have been so terminated by the DEPARTMENT, the termination will not affect any rights or remedies of the DEPARTMENT against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due the CONTRACTOR by the DEPARTMENT will not release the CONTRACTOR from liability.

**14.4 Convenience Termination:**

- 14.4.1 The performance of the Work may be terminated by the DEPARTMENT in accordance with this section in whole or in part, whenever, for any reason the Contracting Officer shall determine that such termination is in the best interest of the DEPARTMENT. Any such termination shall be effected by delivery to the CONTRACTOR of a Notice of Termination, specifying termination is for the convenience of the DEPARTMENT the extent to which performance of Work is terminated, and the date upon which such termination becomes effective.
- 14.4.2 Immediately upon receipt of a Notice of Termination and except as otherwise directed by the Contracting Officer, the CONTRACTOR shall:
- a. Stop Work on the date and to the extent specified in the Notice of Termination;
  - b. Place no further orders or subcontracts for materials, services, or facilities except as

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may be necessary for completion of such portion of the Work as is not terminated;

- c. Terminate all orders and subcontracts to the extent that they relate to the performance of Work terminated by the Notice of Termination;
- d. With the written Approval of the Contracting Officer, to the extent he may require, settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, the cost of which would be reimbursable, in whole, or in part, in accordance with the provisions of the Contract;
- e. Submit to the Contracting Officer a list, certified as to quantity and quality, of any or all items of termination inventory exclusive of items the disposition of which had been directed or authorized by the Contracting Officer;
- f. Transfer to the Contracting Officer the completed or partially completed record drawings, Shop Drawings, information, and other property which, if the Contract had been completed, would be required to be furnished to the DEPARTMENT;
- g. Take such action as may be necessary, or as the Contracting Officer may direct, for the protection and preservation of the property related to the Contract which is in the possession of the CONTRACTOR and in which the DEPARTMENT has or may acquire any interest.

The CONTRACTOR shall proceed immediately with the performance of the above obligations.

14.4.3 When the DEPARTMENT orders termination of the Work effective on a certain date, all Work in place as of that date will be paid for in accordance with Article 13 of the Contract. Materials required for completion and on hand but not incorporated in the Work will be paid for at invoice cost plus 15 % with materials becoming the property of the DEPARTMENT - or the CONTRACTOR may retain title to the materials and be paid an agreed upon lump sum. Materials on order shall be cancelled, and the DEPARTMENT shall pay reasonable factory cancellation charges with the option of taking delivery of the materials in lieu of payment of cancellation charges. The CONTRACTOR shall be paid 10% of the cost, freight not included, of materials cancelled, and direct expenses only for CONTRACTOR chartered freight transport which cannot be cancelled without charges, to the extent that the CONTRACTOR can establish them. The extra costs due to cancellation of bonds and insurance and that part of job start-up and phase-out costs not amortized by the amount of Work accomplished shall be paid by the DEPARTMENT. Charges for loss of profit or consequential damages shall not be recoverable except as provided above.

- a. The following costs are not payable under a termination settlement agreement or Contracting Officer's determination of the termination claim:
  - 1. Loss of anticipated profits or consequential or compensatory damages
  - 2. Unabsorbed home office overhead (also termed "General & Administrative Expense") related to ongoing business operations
  - 3. Bidding and project investigative costs
  - 4. Direct costs of repairing equipment to render it operable for use on the terminated work

14.4.4 The termination claim shall be submitted promptly, but in no event later than 90 days from the effective date of termination, unless extensions in writing are granted by the Contracting Officer upon written request of the CONTRACTOR made within the 90 day period. Upon failure of the CONTRACTOR to submit his termination claim within the time allowed, the Contracting Officer may determine, on the basis of information available to him, the amount, if any, due to the CONTRACTOR by reason of the termination and shall thereupon pay to the CONTRACTOR the amount so determined.

14.4.5 The CONTRACTOR and the Contracting Officer may agree upon whole or any part of the

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amount or amounts to be paid to the CONTRACTOR by reason of the total or partial termination of Work pursuant to this section. The Contract shall be amended accordingly, and the CONTRACTOR shall be paid the agreed amount.

14.4.6 In the event of the failure of the CONTRACTOR and the Contracting Officer to agree in whole or in part, as provided heretofore, as to the amounts with respect to costs to be paid to the CONTRACTOR in connection with the termination of the Work the Contracting Officer shall determine, on the basis of information available to him, the amount, if any, due to the CONTRACTOR by reason of the termination and shall pay to the CONTRACTOR the amount determined as follows:

- a. All costs and expenses reimbursable in accordance with the Contract not previously paid to the CONTRACTOR for the performance of the Work prior to the effective date of the Notice of Termination;
- b. So far as not included under "a" above, the cost of settling and paying claims arising out of the termination of the Work under subcontracts or orders which are properly chargeable to the terminated portions of the Contract;
- c. So far as practicable, claims by the contractor for idled or stand-by equipment shall be made as follows: Equipment claims will be reimbursed as follows:
  1. Contractor-owned equipment usage, based on the contractor's ownership and operating costs for each piece of equipment as determined from the contractor's accounting records. Under no circumstance, may the contractor base equipment claims on published rental rates.
  2. Idle or stand-by time for Contractor-owned equipment, based on your internal ownership and depreciation costs. Idle or stand-by equipment time is limited to the actual period of time equipment is idle or on stand-by as a direct result of the termination, not to exceed 30 days. Operating expenses will not be included for payment of idle or stand-by equipment time.
  3. Rented equipment, based on reasonable, actual rental costs. Equipment leased under "capital leases" as defined in Financial Accounting Standard No. 13 will be considered Contractor-owned equipment. Equipment leased from an affiliate, division, subsidiary or other organization under common control with you will be considered Contractor-owned equipment, unless the lessor has an established record of leasing to unaffiliated lessees at competitive rates consistent with the rates you have agreed to pay and no more than forty percent of the lessor's leasing business, measured in dollars, is with organizations affiliated with the lessor.

14.4.7 The CONTRACTOR shall have the right of appeal under the DEPARTMENT's claim procedures, as defined in Article 15, for any determination made by the Contracting Officer, except if the CONTRACTOR has failed to submit his claim within the time provided and has failed to request extension of such time, CONTRACTOR shall have no such right of appeal. In arriving at the amount due the CONTRACTOR under this section, there shall be deducted:

- a. All previous payments made to the CONTRACTOR for the performance of Work under the Contract prior to termination;
- b. Any claim for which the DEPARTMENT may have against the CONTRACTOR;
- c. The agreed price for, or the proceeds of sale of, any materials, supplies, or other things acquired by the CONTRACTOR or sold pursuant to the provisions of this section and not otherwise recovered by or credited to the DEPARTMENT; and,
- d. All progress payments made to the CONTRACTOR under the provisions of this section.

14.4.8 Where the Work has been terminated by the DEPARTMENT said termination shall not affect or terminate any of the rights of the DEPARTMENT against the CONTRACTOR or his Surety then existing or which may thereafter accrue because of such default. Any retention or



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payment of monies by the DEPARTMENT due to the CONTRACTOR under the terms of the Contract shall not release the CONTRACTOR or his Surety from liability.

- 14.4.9 The contractor's termination claim may not include claims that pre dated the notice for termination for convenience. Those claims shall be prosecuted by the contractor under Article 15.
- 14.4.10 The contractor's termination claim may not exceed the total dollar value of the contract as awarded plus agreed upon change orders less the amounts that have been paid for work completed.
- a. Unless otherwise provided for in the Contract Documents, or by applicable statute, the CONTRACTOR, from the effective date of termination and for a period of three years after final settlement under this Contract, shall preserve and make available to the DEPARTMENT at all reasonable times at the office of the CONTRACTOR, all its books, records, documents, and other evidence bearing on the cost and expenses of the CONTRACTOR under his Contract and relating to the Work terminated hereunder.
  - b. Definitions. In this Subsection 108-1.09, the term "cost" and the term "expense" mean a monetary amount in U.S. Dollars actually incurred by you, actually reflected in your contemporaneously maintained accounting or other financial records and supported by original source documentation.
  - c. Cost Principles. The Department may use the federal cost principles at 48 CFR §§ 31.201-1 to 31.205-52 (or succeeding cost principles for fixed price contracts) as guidelines in determining allowable costs under this Subsection to the extent they are applicable to construction contracts and consistent with the specifications of this Contract. The provisions of this contract control where they are more restrictive than, or inconsistent with, these federal cost principles."

## **SC-15-CLAIMS AND DISPUTES**

At General Conditions Article 15 – Claims and Disputes, delete this section in its entirety and substitute the following text:

### **"ARTICLE 15 - CLAIMS FOR ADJUSTMENT AND DISPUTES**

#### **15.1 Notification**

- 15.1.1 The CONTRACTOR shall notify the DEPARTMENT in writing as soon as the CONTRACTOR becomes aware of any act or occurrence which may form the basis of a claim for additional compensation or an extension of Contract Time or of any dispute regarding a question of fact or interpretation of the Contract. The DEPARTMENT has no obligation to investigate any fact or occurrence that might form the basis of a claim or to provide any additional compensation or extension of Contract Time unless the CONTRACTOR has notified the DEPARTMENT in writing in a timely manner of all facts the CONTRACTOR believes form the basis for the claim.
- 15.1.2 If the CONTRACTOR believes that he is entitled to an extension of Contract Time, then the CONTRACTOR must state the contract section on which he basis his extension request, provide the DEPARTMENT with sufficient information to demonstrate that the CONTRACTOR has suffered excusable delay, and show the specific amount of time to which the CONTRACTOR is entitled. The DEPARTMENT will not grant an extension of Contract Time if the CONTRACTOR does not timely submit revised schedules under **Section 01310.**
- 15.1.3 If the matter is not resolved by agreement within 7 days, the CONTRACTOR shall submit an Intent to Claim, in writing, to the DEPARTMENT within the next 14 days.
- 15.1.4 If the CONTRACTOR believes additional compensation or time is warranted, then he must

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immediately begin keeping complete, accurate, and specific daily records concerning every detail of the potential claim including actual costs incurred. The CONTRACTOR shall provide the DEPARTMENT access to any such records and furnish the DEPARTMENT copies, if requested. Equipment costs must be based on the CONTRACTOR's internal rates for ownership, depreciation, and operating expenses and not on published rental rates. In computing damages, or costs claimed for a change order, or for any other claim against the Department for additional time, compensation or both, the contractor must prove actual damages based on internal costs for equipment, labor or efficiencies. Total cost, modified total cost or jury verdict forms of presentation of damage claims are not permissible to show damages. Labor inefficiencies must be shown to actually have occurred and can be proven solely based on job records. Theoretical studies are not a permissible means of showing labor inefficiencies. Home office overhead will not be allowed as a component of any claim against the Department.

- 15.1.5 If the claim or dispute is not resolved by the DEPARTMENT, then the CONTRACTOR shall submit a written Claim to the Contracting Officer within 90 days after the CONTRACTOR becomes aware of the basis of the claim or should have known the basis of the claim, whichever is earlier. The Contracting Officer will issue written acknowledge of the receipt of the Claim.
- 15.1.6 The CONTRACTOR waives any right to claim if the DEPARTMENT was not notified properly or afforded the opportunity to inspect conditions or monitor actual costs or if the Claim is not filed on the date required.

## **15.2 Presenting the Claim**

- 15.2.1 The Claim must include all of the following:
- a. The act, event, or condition the claim is based on
  - b. The Contract provisions which apply to the claim and provide relief
  - c. The item or items of Contract work affected and how they are affected
  - d. The specific relief requested, including Contract Time if applicable, and the basis upon which it was calculated
  - e. A statement certifying that the claim is made in good faith, that the supporting cost and pricing data are accurate and complete to the best of your knowledge and belief, and that the amount requested accurately reflects the Contract adjustment which the CONTRACTOR believes is due.

## **15.3 Claim Validity, Additional Information, and DEPARTMENT's Action**

- 15.3.1 The Claim, in order to be valid, must not only show that the CONTRACTOR suffered damages or delay but that it was caused by the act, event, or condition complained of and that the Contract provides entitlement to relief for such act, event, or condition.
- 15.3.2 The DEPARTMENT can make written request to the CONTRACTOR at any time for additional information relative to the Claim. The CONTRACTOR shall provide the DEPARTMENT the additional information within 30 days of receipt of such a request. Failure to furnish the additional information may be regarded as a waiver of the Claim.

## **15.4 Contracting Officer's Decision**

The CONTRACTOR will be furnished the Contracting Officer's Decision within 90 days, unless the Contracting Officer requests additional information or gives the CONTRACTOR notice that the time for issuing a decision is being extended for a specified period under AS 36.30.620. The Contracting Officer's decision is final and conclusive unless, within 14 days of receipt of the decision, the CONTRACTOR delivers a Notice of Appeal to the Appeals Officer. Procedures for appeals are covered under AS 36.30.625 and AS 36.30.630.

## **15.5 Fraud and Misrepresentation in Making Claims**

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Criminal and Civil penalties authorized under AS 36.30.687 (including, but not limited to, forfeiture of all claimed amounts) may be imposed on the CONTRACTOR if the CONTRACTOR makes or uses a misrepresentation in support of a claim or defraud or attempt to defraud the DEPARTMENT at any stage of prosecuting a claim under this Contract.”

**END OF SECTION**

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## **State Wage Rates**

State wage rates can be obtained at

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

**Pamp600 Issue 44, effective April 1, 2022**

SECTION 01005  
ADMINISTRATIVE PROVISIONS

PART I GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Local Conditions
- B. Permits, Fees, and Inspections
- C. Alternates
- D. Preconstruction Meeting
- E. Applications for Payment
- F. Contractor Use of Premises
- G. Owner Occupancy
- H. Owner - Furnished Products
- I. Coordination
- J. Reference Standards

1.02 RELATED REQUIREMENTS

- A. General and Special Conditions

1.03 LOCAL CONDITIONS

- A. Bidders shall familiarize themselves with the Contract Documents and existing conditions, which affect Work, required by the Contract Documents. It will be assumed that bidders have made a personal examination of the jobsite, existing conditions, and documents for prior construction projects associated with this facility made available by the Owner for review by Bidders during the bid period.
- B. Failure to visit the jobsite, to review existing conditions, or to review documents for prior construction projects associated with this facility made available by the Owner for review by Bidders during the bid period will in no way relieve the successful Bidder from the necessity of furnishing any materials or performing any Work that may be required to complete the Work in accordance with the Contract Documents with no additional cost to the Owner.
- C. For building access and for access to the documents for prior construction projects associated with this facility contact:

James Wann, Maintenance Foreman, 261-4338

1.04 PERMITS, FEES, AND INSPECTIONS

- A. Obtain, pay for, and comply with the requirements of all permits, fees, and inspections required by public authorities.
- B. Transmit copies of permit applications, permits received, and public authority inspection reports to the Contracting Officer within three days of making permit application or receiving permits or reports.

1.05 ALTERNATES

- A. Alternates will be exercised at the option of Owner as specified on Bid Schedule. Accepted alternates will be indicated on the Contract and included within the conformed Contract Documents.
- B. Coordinate related work and modify surrounding work affected by accepted alternates as required to complete the Work.
- C. Provide all Work as part of the Base Bid except that Work specifically indicated to be provided as part of an alternate.

1.06 PRECONSTRUCTION MEETING

- A. Attend Owner initiated preconstruction meeting.

1.07 APPLICATIONS FOR PAYMENT

- A. Submit two copies of each application under procedures of Section 01027.
- B. Content and Format: That specified for schedule of values in Section 01027.

1.08 CONTRACTOR USE OF PREMISES

- A. Limit use of premises for Work and for construction operations, to allow for Owner occupancy, Work of other Contractors, and public access.
- B. Limit areas of construction operations to those areas requiring renovation only.
- C. Give written notice two weeks in advance of beginning of Work in any Work area.
- D. Do not smoke except in specifically designated smoking areas.
- E. Take reasonable and adequate precautions to protect the Owner's property from damage during execution of Work. Restore any damage to Owner property resulting from execution of Work or replace in a manner satisfactory to the Contracting Officer.
- F. Take reasonable and adequate precautions to protect the Owner's property from damage during execution of Work. Restore any damage to Owner property resulting from execution of Work or replace in a manner satisfactory to the Contracting Officer.
- G. Limit construction activities which generate noise levels in excess of NC=40 in classrooms, NC=50 in office areas, and NC=60 in other areas to between 7 p.m. and 7 a.m. Monday through Friday and all day Saturday and Sunday.
- H. Limit construction access to building to the location indicated. Keep construction access points locked at all times. Contractor will be provided with two sets of keys for construction access points.
- I. Move Owner tools, equipment, shelving, stored materials, etc. as required to accomplish Work. Return to original location as soon as possible.
- J. Protect Owner tools, equipment, shelving, stored materials, and equipment, etc. from Work.

K. In Owner occupied areas:

1. Limit use of premises for Work and for construction operations to between 8:00 a.m. and 5:30 p.m. Monday through Friday. If requested by the Contractor and approved by the Project Manager the Contractor may work on the project outside these hours if the Contractor's activities do not interfere with owner operations.
  2. Cover and protect from dust and debris, at the start of each work day, electronic office equipment such as personal computers, computer terminals, facsimile machines, copiers, printers, postage meters, VCRs, monitors, typewriters, etc. Remove protection at the end of each work day.
  3. Do not use furniture, such as countertops, desks, filing cabinets, book shelves, and tables as work surfaces or as steps to access Work.
  4. At the end of each workday, move back to original location equipment and furniture moved to accommodate Work. Do not move electronic equipment unless absolutely necessary to accomplish Work.
  5. At the end of each workday replace ceiling tiles removed to access Work.
  6. At the end of each work day, clean work areas, including floors with a vacuum, and remove tools, equipment, and construction material from work areas.
- M. Coordinate temporary shutdowns of any of the existing facilities' mechanical or electrical systems affecting systems in Owner occupied areas with the Contracting Officer. Schedule shutdowns for nights and weekends. Provide a minimum five-day notice.
- N. Existing systems shall be fully operational for intended purpose at the beginning of each Owner workday.

1.09 OWNER OCCUPANCY

- A. The Owner will occupy premises during entire period of construction for the conduct of its normal operations.
- B. Maintain IBC complying access to and through corridors, stairways, and building exits at all times.
- C. Cooperate with Owner to minimize conflict and to facilitate its operations. In case of conflict accept Contracting Officer's direction as final and adjust use of premises accordingly.
- D. Coordinate Work in and use of premises with the Owner

1.10 COORDINATION

- A. Coordinate Work of the various Sections of Specifications prior to ordering materials and fabrication to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later. Notify Contracting Officer of conflicts between elements prior to installation of any element.



- B. Verify characteristics of elements of interrelated operating equipment are compatible; coordinate Work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical Work, which is indicated diagrammatically on Drawings. Follow routing shown for ducts and conduits as closely as practical. Make piping, duct, and conduit runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas, unless otherwise indicated, conceal pipes, ducts, and wiring in the construction.
- E. After Owner acceptance of Work, coordinate access to site by various trades for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner activities.

#### 1.11 REFERENCE STANDARDS

- A. For products or workmanship specified by association, trades, or regulatory agency standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Obtain a copy of standards referenced. Maintain a copy at the jobsite during execution of Work to which the standard applies.
- C. The date of the standard is that in effect as of the bid date except when a specific date is specified.

#### 1.12 ONE YEAR CORRECTION PERIOD

- A. If within one year after the date of Final Completion or such longer period of time as may be prescribed by Regulatory Requirements or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work, materials, or products are found to be defective, the Contractor shall promptly, without cost to the Owner and in accordance with the Contracting Officer's written instructions, either correct such defective Work, or, if it has been rejected by the Contracting Officer, remove it from the site and replace it with conforming Work.
- B. If the Contractor does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, the Owner may have the defective Work corrected or the rejected Work removed and replaced, and all direct, indirect, and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals) will be paid by the Contractor.
- C. In special circumstances where a particular item of equipment is placed in continuous service for the benefit of the Owner before Substantial Completion of all the Work, the correction period for that item may begin on an earlier date if so provided in the Specifications of by Change Order.
- D. Provisions of this paragraph are not intended to shorten the statute of limitations for bringing an action.

PART 2	PRODUCTS	Not Used
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PART 3	PARTS	Not Used
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END OF SECTION

SECTION 01010  
SUMMARY OF WORK

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Basic Bid.
- B. Work by Others.
- C. Hazardous Materials
- D. Work Inside Facility
- E. Work Plans and Access to Facility, Individual Work Areas
- F. Shut Offs/Disruptions to Service
- G. Use of Premises.
- H. Using Agency Occupancy.
- I. Coordination
- J. Parking/Staging

1.02 RELATED REQUIREMENTS

- A. Document 00200 – Information available to bidders.
- B. Document 00700 - General Conditions: Provisions for use of site, and Using Agency occupancy. Relations of CONTRACTOR- Subcontractors.
- C. Document 00800 - Supplementary Conditions: Modifications to General Conditions.
- D. Section 01400 – Quality Control
- E. Section 01540 – Security.

1.03 WORK COVERED BY CONTRACT DOCUMENTS

- A. Work covered by the contract documents is located
- B. The DEPARTMENT is acting for the State of Alaska.

1.04 CONTRACT METHOD

- A. Construct the Work under a single lump sum Contract.

1.05 BASIC BID

- A. That portion of the Work described within these documents (taken as a whole) as the Basic Bid scope. Basic Bid work includes all work shown on the plans and specifications.
- B. Project will be constructed under a general construction contract.

1.06 WORKS BY OTHERS

- A. Cooperate with other Contractors and the DEPARTMENT to minimize conflict with construction operation.

1.07 HAZARDOUS MATERIALS

- A. All light fixtures to be removed shall be treated as positive for containing PCBs unless proven otherwise.

- B. CONTRACTOR to be aware that other hazardous materials may be within the facility. See Section 00700 Article 4.3.

#### 1.08 WORK INSIDE FACILITY

- A. Work within the facility shall be conducted only between the hours of 8:00 am and 5:30 pm, unless specifically approved by the Maintenance Supervisor. Requests for work outside of these hours must be submitted in writing 24 hours in advance.
- B. CONTRACTOR shall not under any circumstances leave tools or equipment unattended within the limits of the project site unless secured in a locked tool storage shed/box or vehicle. CONTRACTOR will be liable for any damages to persons and/or property resulting from unattended tools or equipment.
- C. No firearms or ammunition allowed on the grounds, to include locked vehicles.
- D. The use of powder-activated tools must be approved by the project manager. Request for such tools must be submitted to the Maintenance Supervisor in writing three (3) working days in advance.

#### 1.09 SHUTOFFS / DISRUPTIONS TO SERVICE

- A. Work with the Maintenance Supervisor to schedule disruption for a time, which minimizes impact on facility operations. Provide the Engineer written notification of any disruption to service at least 24 hours in advance of scheduled disruption or shutoff.
- B. Plan work to minimize down time. Work with DEPARTMENT to schedule disruption for a time that minimizes impact on USING AGENCY's operations.
- C. Provide written work plan and schedule for disruptions to service that exceed one hour.
- D. Contractor must provide protection as stated in Municipal Fire Codes and Safety Codes while working on the fire protection system.

#### 1.10 CONTRACTOR'S USE OF PREMISES

- A. Coordinate use of the premises under direction of DEPARTMENT.
- B. Assume full responsibility for protection and safekeeping of products under this Contract.
- C. Assume full responsibility for the protection of the existing facility and contents, from damage due to construction operations.

#### 1.11 USING AGENCY OCCUPANCY

- A. The User Agency will continue operations adjacent to the site during entire construction period. Cooperate with DEPARTMENT in scheduling operations to minimize conflict and to facilitate the User Agency's operations.
- B. CONTRACTOR shall provide Material Safety Data Sheets for all products that may produce unpleasant odors.

#### 1.12 COORDINATION

- A. Coordinate Work of the various elements of the plans to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.
- B. Verify if characteristics of elements of interrelated operating equipment are compatible; coordinate Work of various trades having interdependent responsibilities for installing,

connecting to, and placing in service, such equipment.

- C. Coordinate space requirements and installation of mechanical and electrical work, which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduits, as closely as practicable; make runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs. Coordinate work with existing elements in the building. Do not locate piping, conduit or other products where they will block access to equipment or junction boxes.
- D. In finished areas except as otherwise shown, conceal pipes, ducts, and wiring in the construction. .
- E. Execute cutting and patching to integrate elements of Work, provide openings for penetrations of existing surfaces. Seal penetrations through floors, walls, partitions, and ceilings.

#### 1.13 PARKING / STAGING

- A. CONTRACTOR to coordinate staging area with Facility Maintenance Supervisor.
- B. CONTRACTOR may use established facility parking.
- C. CONTRACTOR will be responsible for all additional required storage/staging and parking off site at no charge to the Department.

PART 2 PRODUCTS                      Not Used

PART 3 EXECUTION                      Not used

END OF SECTION

SECTION 01020  
INTENT OF DOCUMENTS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Explanation of intent and terminology of the Construction Documents.

1.02 RELATED REQUIREMENTS

- A. Document 00700 - General Conditions: Article 1 Definitions relating to 'Drawings' and 'Specifications'.
- B. Document 00700 - General Conditions: Article 3 Contract Documents relating to Intent, Amending, and Reuse.

1.03 SPECIFICATION FORMAT AND COMPOSITION

- A. Specifications are divided into Divisions and Sections for the convenience of writing and using. Titles are not intended to imply a particular trade jurisdiction. DEPARTMENT is not bound to define the limits of any subcontract, and will not enter into disputes between the CONTRACTOR and his employees, including Subcontractors.
- B. Pages are numbered independently for each Section, and recorded in the Table of Contents. Section number is shown with the page number at the bottom of each page. The end of each Section of the specifications is ended by "End of Section". It is CONTRACTOR'S responsibility to verify that Contract Documents received for bidding and/or construction are complete in accordance with Table of Contents.
- C. The language employed in the Contract Documents is addressed directly to the CONTRACTOR. Imperative or indicative language is generally employed throughout and requirements expressed are the mandatory responsibility of the CONTRACTOR, even though the work specified may be accomplished by specialty subcontractors engaged by the CONTRACTOR. References to third parties in this regard shall not be interpreted in any way as to relieve the CONTRACTOR of his or her responsibility under this Contract.
- D. These Specifications are of the abbreviated or "streamlined" type, and may include incomplete sentences.
- E. Omissions of words or phrases such as "the CONTRACTOR shall," "in conformity therewith," "shall be," "as noted on the Drawings," "according to the Drawings," "a," "an," "the" and "all" are intentional.
- F. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the Drawings.

1.04 DRAWINGS: CONTENT EXPLANATION

- A. Drawings, Dimensions and Measurements.
  - 1. Contract Documents do not purport to describe in detail, absolute and complete construction information. In some instances drawings are diagrammatic.

2. CONTRACTOR shall provide verification of actual site conditions and shall provide complete and operational systems as specified when drawings do not provide full detail.
3. Where on any of the Drawings a portion of the work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to all other portions of the Work.
4. Wherever a detail is referenced and developed for a specific condition, same or similar detail shall apply to identical or similar conditions elsewhere on Project even though not specifically referenced.
5. Where the word "similar" occurs on the Drawings, it shall be interpreted in its general sense and not as meaning identical, all details shall be worked out in relation to their location and their connection with other parts of the work.
6. The figured dimensions on the Drawings or notes indicating dimensions shall be used instead of measurements of the Drawings by scale.
7. No scale measurements shall be used as a dimension to work with except on "full size" Drawings not dimensioned.

#### 1.05 COMMON TERMINOLOGY

A. Certain items used generally throughout the Specifications and Drawings are used as follows:

1. Indicated: The term "indicated" is a cross reference to details, notes or schedules on the Drawings, other paragraphs or schedules in the Specifications, and similar means of recording requirements in the Contract Documents. Where terms such as "shown", "noted", "schedules", and "specified" are used in lieu of "indicate", it is for the purpose of helping the reader accomplish the cross reference, and no limitation of location is intended except as specifically noted.
2. Installer: The person or entity engaged by CONTRACTOR, his Subcontractor or sub-subcontractor for the performance of a particular unit of Work at the Project site, including installation, erection, application and similar required operations. It is a general requirement that installers be recognized experts in the work they are engaged to perform.
3. Furnish: Except as otherwise defined in greater detail, the term "furnish" is used to mean "...supply and deliver to the Project site, ready for unpacking, assembly and installation..."
4. Provide: Except to the extent further defined, the term "provide" means to furnish and install, complete and ready for the intended use.
5. Guarantee and Warranty: "Warranty" is generally used in conjunction with products manufactured or fabricated away from the Project site, and "guarantee" is generally used in conjunction with units of work which require both products and substantial amounts of labor at the Project site. The resulting difference is that warranties are frequently issued by manufacturers, and guarantees are generally issued by CONTRACTOR and frequently supported (partially) by product warranties from manufacturers.

#### 1.06 CONFLICTS

- A. Report any conflicts to Contracting Officer for clarification.

PART 2 PRODUCTS	Not Used
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PART 3 EXECUTION	Not Used
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END OF SECTION



SECTION - 01027  
APPLICATIONS FOR PAYMENT

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Procedures for preparation and submittal of Applications for Payment.

1.02 RELATED REQUIREMENTS

- A. Document 00510 - Construction Contract - Contract Form 06D-10a and Bid Schedule: Method of Payment and Contract Price and Amounts of Liquidated Damages.
- B. Document 00700 - General Conditions: Progress Payments, and Final Payment.
- C. Section 00800 – Supplementary Conditions to General Conditions of the Construction Contract for Buildings: SC-11.2 and SC-11.8.
- D. Section 01300 - Submittals: Procedures, Schedule of Values .
- E. Section 01700 - Contract Closeout: Closeout Procedures.

1.03 FORMAT

- A. Application for Payment form in format approved by the DEPARTMENT.

1.04 PREPARATION OF APPLICATIONS

- A. Type required information on Application for Payment form approved by DEPARTMENT.
- B. Execute certification by original signature of authorized officer upon each copy of the Application for Payment.
- C. Submit names of individuals authorized to be responsible for information submitted on application for payment.
- D. Indicate breakdown of costs for each item of the Work on accepted schedule of values. Provide dollar value in each column for each line item for portion of Work performed and for stored products.
- E. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of Work.
- F. Prepare Application for Final Payment as specified in Section 01700.

1.05 SUBMITTAL PROCEDURES

- A. Submit two copies of each Application for Payment at times stipulated in Contract.
- B. Submit under transmittal letter specified in Section 01300.

1.06 SUBSTANTIATING DATA

- A. When DEPARTMENT requires substantiating information, submit data justifying line item amounts in question.
- B. Substantiating data required under 7.12.3 and 7.12.4 shall be submitted (or updated) when the Application for Payment includes a current request for payment on an item of Work required to include Alaska "agricultural/wood" products.
- C. Provide one copy of data with cover letter for each copy of Application. Show Application number and date, and line item by number and description.

1.07 SUBMITTALS WITH APPLICATION FOR PAYMENT

- A. Submit the following with each Application for Payment.
  - 1. Updated construction schedule as required by Section 01300 - Submittals.
  - 2. Updated Schedule of Values as required by Section 01300 – Submittals: Schedule of Values.
  - 3. The contractor's as-builts will be reviewed prior to approving each application for payment.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

END OF SECTION

SECTION 01028  
CHANGE ORDER PROCEDURES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Procedures for processing Change Orders.

1.02 RELATED REQUIREMENTS

- A. Document 00312 - Bid Schedule: Total amount bid for lump sum items
- B. Document 00510 - Contract Form: Total amount of Contract Price, as awarded
- C. Document 00700 - General Conditions: Governing requirements for changes in the Work, in Contract Price, and Contract Time.
- D. Document 00800 - Supplementary Conditions: Modifications to Document 00700 - General Conditions.
- E. Section 01027 - Applications for Payment.
- F. Section 01300 - Submittals: Construction Progress Schedules, Schedule of Values.
- G. Section 01600 – Material and Equipment: Product Options, Substitutions.
- H. Section 01700 – Contract Closeout: Project Record Documents.

1.03 SUBMITTALS

- A. Submit name of the individual authorized to accept changes, and to be responsible for informing others in CONTRACTOR's employ of changes in the Work.
- B. Change Order Forms will be prepared by the DEPARTMENT.

1.04 DOCUMENTATION OF CHANGE IN CONTRACT PRICE AND CONTRACT TIME

- A. Maintain detailed records of work done on a Cost of the Work plus a Fee basis. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the Work. Incomplete or unsubstantiated costs will be disallowed.
- B. CONTRACTOR shall submit a complete, detailed, itemized cost breakdown addressing impact on Contract Time and Contract Price with each proposal.
- C. On request, provide additional data to support computations:
  - 1. Quantities of products, labor, and equipment.
  - 2. Taxes, insurance and bonds.
  - 3. Overhead and profit.

4. Justification for any change in Contract Time.
  5. Credit for deletions from Contract, similarly documented.
- D. Support each claim for additional costs, and for work done on a cost of the Work plus a Fee basis, with additional information:
1. Origin and date of claim.
  2. Dates and times work was performed, and by whom.
  3. Time records and wage rates paid.
  4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

#### 1.05 PRELIMINARY PROCEDURES

- A. DEPARTMENT may submit a Proposal Request which includes: Detailed description of change with supplementary or revised Drawings and Specifications, the projected time for executing the change, with a stipulation of any overtime work required, and the period of time during which the requested price will be considered valid.
- B. CONTRACTOR may initiate a change by submittal of a request to DEPARTMENT describing the proposed change with a statement of the reason for the change, and the effect on Contract Price and Contract Time with full documentation.

#### 1.06 CONSTRUCTION CHANGE AUTHORIZATION

- A. Shall be in accordance with Article 9 - Changes: in Document 00700 - General Conditions.

#### 1.07 FIXED PRICE CHANGE ORDER

- A. CONTRACTOR shall submit an itemized price proposal in sufficient detail to fully explain the basis for the proposal. Attach invoices and receipts for products, equipment, subcontracts and as requested by the DEPARTMENT. CONTRACTOR and the DEPARTMENT shall then negotiate an equitable price (and time adjustment if appropriate) in good faith. The Change Order will reflect the results of those negotiations. If negotiations break down CONTRACTOR may be directed to perform the work under COST OF THE WORK CHANGE ORDER.

#### 1.08 UNIT PRICE CHANGE ORDER

- A. For pre-determined Unit Prices and quantities, Change Order will be executed on a lump sum basis.
- B. For unit costs or quantities of units of Work which are not predetermined, execute Work under a Directive. Changes in Contract Price or Contract Time will be computed as specified for cost of the Work plus fee via Change Order.

#### 1.09 COST OF THE WORK CHANGE ORDER

- A. CONTRACTOR shall submit documentation required in 1.04 on a daily basis for certification by the Project Manager. Project Manager will indicate by signature that the submitted documentation is acceptable.

- B. After completion of the change and within 14 Calendar Days, unless extended by the Project Manager, the CONTRACTOR shall submit in final form an itemized account with support data of all costs. Support data shall have been certified by the Project Manager, as required above in paragraph A.

1.10 EXECUTION OF CHANGE ORDERS

- A. DEPARTMENT will issue Change Orders for signatures of parties as provided in Conditions of the Contract.

1.11 CORRELATION OF CONTRACTOR SUBMITTALS

- A. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Price as shown on Change Order.
- B. Promptly revise progress schedules to reflect any change in Contract Time, revise subschedules to adjust times for other items of Work affected by the change, and resubmit.
- C. Promptly enter changes in project record documents.

PART 2 PRODUCTS      Not Used

PART 3 EXECUTION      Not Used

END OF SECTION

SECTION 01040  
COORDINATION

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Coordination of Work of Contract.

1.02 RELATED REQUIREMENTS

- A. Section 01010 - Summary of Work.
- B. Section 01045 – Cutting and Patching.
- C. Section 01200 – Project Meetings.
- D. Section 01600 – Material and Equipment: Substitutions.
- E. Section 10701 – Contract Closeout Procedures.

1.03 DESCRIPTION

- A. Coordinate scheduling, submittals, and work of the various sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.
- B. Coordinate sequence of Work to accommodate Using Agency occupancy as specified in Section 01005.

1.04 MEETINGS

- A. Coordinate sequence of Work to accommodate Using Agency occupancy as specified in Section 01005.

1.05 COORDINATION OF SUBMITTALS

- A. Schedule and coordinate submittals specified in Section 01300.
- B. Coordinate Work of various sections having interdependent responsibilities for installing connecting to, and placing in service, such equipment.
- C. Coordinated requests for substitutions to assure compatibility of space, of operating elements, and affect on Work of other sections.

1.06 COORDINATION OF SPACE

- A. Coordinate use of Project space and sequence of installation of mechanical and electrical Work which is indicated diagrammatically on Drawings. Follow routings shown for pipes, ducts, and conduits as closely as practicable, with due allowance for available physical space; make runs parallel with lines of building. Utilize space efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- B. In finished areas, except as otherwise shown, conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

1.07 COORDINATION OF CONTRACT CLOSEOUT

- A. Coordinate completion and cleanup of Work of separate sections in preparation for Substantial Completion.
- B. After Using Agency occupancy of premises, coordinate access to site by various sections for correction of Defective Work and Work not in accordance with Contract Documents, to minimize disruption of Using Agency activities.
- C. Assemble and coordinate close submittal specified in Section 01701.

PART 2 PRODUCTS                      Not Used

PART 3 EXECUTION                      Not Used

END OF SECTION

SECTION 01045  
CUTTING AND PATCHING

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Requirements and limitations for cutting and patching of Work.

1.02 RELATED REQUIREMENTS

- A. Section 01005 – Administrative Provisions
- B. Section 01010 - Summary of Work.
- C. Section 01600 - Materials and Equipment: Substitutions.
- D. Individual Specifications Sections:
  - 1. Cutting and patching incidental to Work of the section.
  - 2. Advance notification to other sections of openings required in Work of those sections.
  - 3. Limitations on cutting structural members.

1.03 SUBMITTALS

- A. Submit written request in advance of cutting or alteration which affects:
  - 1. Structural integrity of any element of Project.
  - 2. Integrity of weather-exposed or moisture-resistant element.
  - 3. Efficiency, maintenance, or safety of any operational element.
  - 4. Visual qualities of sight-exposed elements.
  - 5. Work of DEPARTMENT or separate Contractor.
- B. Include in request:
  - 1. Identification of Project and DEPARTMENT's Project number.
  - 2. Location and description of affected Work.
  - 3. Necessity for cutting or alteration.
  - 4. Description of proposed Work, and products to be used.
  - 5. Alternatives to cutting and patching.
  - 6. Effect on Work of DEPARTMENT or separate Contractor.
  - 7. Written permission of affected separate Contractor.
  - 8. Date and time Work will be executed.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Those required for original installation.
- B. For any change in materials, submit request for substitution under provisions of Section 01600.



3.01 GENERAL

- A. Execute cutting, fitting, and patching to complete Work, and to:
  - 1. Fit the several parts together, to integrate with other Work.
  - 2. Uncover Work to install ill-timed Work.
  - 3. Remove and replace non-conforming and Defective Work.
  - 4. Remove samples of installed Work for testing.
  - 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

3.02 INSPECTION

- A. Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- B. Notify the Department immediately of any suspected hazardous materials.
- C. After uncovering, inspect conditions affecting performance of work.
- D. Beginning of cutting or patching means acceptance of existing conditions.

3.03 PREPARATION

- A. Provide supports to assure structural integrity of surroundings; devices and methods to protect other portions of Project from damage.
- B. Provide protection from elements for areas which may be exposed by uncovering Work; maintain excavations free of water.

3.04 PERFORMANCE

- A. Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- B. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval. Cutting structural reinforcement with heat is strictly forbidden without prior written approval.
- C. Restore Work with new products in accordance with requirements of Contract Documents.
- D. Fit Work tightly to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- E. At penetrations of fire-rated wall, ceiling, or floor construction, completely seal voids with fire-rated material, full thickness of the construction element or in accordance with listed U.L. assembly requirements.
- F. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

END OF SECTION

**SECTION 01073**  
**EXPLANATIONS: DRAWINGS AND SPECIFICATIONS**

**PART 1     GENERAL**

**1.1     REQUIREMENTS INCLUDED**

- A. Explanation of terminology used within the Drawings and Specifications.

**1.2     RELATED REQUIREMENTS**

- A. Section 01005 - Administrative Provisions
- B. Section 01010 - Summary of Work
- C. Section 01020 - Intent of Documents

**1.3     SPECIFICATION FORMAT AND COMPOSITION**

- A. Specifications are divided into Divisions and Sections for the convenience of writing and using. Titles are not intended to imply a particular meaning or to fully describe the Work of each Division or Section, and are not an integral part of the text that specifies the requirements. Contracting Officer is not bound to define the limits of any subcontract, and will not enter into disputes between the Contractor and his employees, including subcontractors.
- B. Pages are numbered independently for each Section. Section number is shown with the page number at the bottom of each page. "End of Section" is noted on the last page of each Section. It is Contractor's responsibility to verify that Contract Documents received for bidding and construction are complete in accordance with Table of Contents.
- C. These Specifications are of the abbreviated, or "streamlined" type, and include incomplete sentences.
- D. Omissions of words or phrases such as "the Contractor shall," "in conformity therewith," "shall be," "as noted on the Drawings," "according to the Drawings," "a," "an," "the" and "all" are intentional.
- E. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the Drawings.

**1.4     DRAWINGS: CONTENT EXPLANATION**

- A. Where on any of the Drawings a portion of the Work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to all other portions of the Work.
- B. Wherever a detail is referenced and developed for a specific condition, same or similar detail shall apply to identical or similar conditions elsewhere on Project even though not specifically referenced.
- C. Where the word "similar" occurs on the Drawings, it shall be interpreted in its general sense and not as meaning identical, all details shall be worked out in relation to their location and their connection with other parts of the Work.

- D. The figured dimensions on the Drawings or notes indicating dimensions shall be used instead of measurements of the Drawings by scale. No scale measurements shall be used as a dimension.
- E. Provide piping, ductwork, equipment, and accessories indicated on the Drawings unless it is specifically indicated that the piping, ductwork, equipment, or accessory is existing.
- F. Unless otherwise indicated, abbreviations and symbols used in the Drawings and Specifications are intended to have the meaning commonly accepted in the construction industry. Contact the Contracting Officer for definition if any question arises concerning them.
- G. Certain items used generally throughout the Specifications and Drawings are used as follows:
  - 1. Indicated: The term "indicated" is a cross reference to details, notes or schedules on the Drawings, other paragraphs or schedules in the Specifications, and similar means of recording requirements in the Contract Documents. Where terms such as "shown", "noted", "schedules", and "specified" are used in lieu of "indicate", it is for the purpose of helping the reader accomplish the cross reference, and no limitation of location is intended except as specifically noted.
  - 2. Installer: The person or entity engaged by Contractor, his subcontractor or sub-subcontractor for the performance of a particular unit of work at the Project site, including installation, erection, application, and similar required operations. It is a general requirement that installers be recognized experts in the Work they are engaged to perform.
  - 3. Provide: Except to the extent further defined, the term "provide" means to supply and install, complete and ready for the intended use.
  - 4. Furnish: Except as otherwise defined in greater detail, the term "furnish" is used to mean the same as "provide".
  - 5. Guarantee and Warranty: "Warranty" is generally used in conjunction with products manufactured or fabricated away from the Project site, and "guarantee" is generally used in conjunction with units of work which require both products and substantial amounts of labor at the Project site. The resulting difference is that warranties are frequently issued by manufacturers, and guarantees are generally issued by Contractor and frequently supported (partially) by product warranties from manufacturers.
  - 6. Work: Work is the act of, and the result of, performing services, furnishing labor, furnishing and incorporating materials and equipment into the Project and performing other duties and obligations, all as required by the Contract Documents. Such Work, however incremental, shall culminate in the entire completed Project, or the various separately identifiable parts thereof.
  - 7. Contracting Officer: Contracting Officer means Contracting Officer or Contracting Officer's Representative.

## 1.5 CONFLICTS

- A. Report any conflicts to Contracting Officer for clarification.

**PART 2**      **PRODUCTS**  
[Not Used]

**PART 3**      **EXECUTION**  
[Not Used]

**END OF SECTION**

SECTION 01090  
REFERENCE STANDARDS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Quality Assurance.
- B. Applicability of Reference Standards.
- C. Provision of Reference Standards at site.
- D. Acronyms used in Contract Documents for Reference Standards. Source of Reference Standards.

1.02 RELATED REQUIREMENTS

- A. Document 00700 - General Conditions: Paragraph 3.4.2.

1.03 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. The date of the standard is that in effect as of the Project Advertisement date, or Effective Date of the Contract when there was no Advertisement, except when a specific date is specified.
- C. When required by an individual Specification section, obtain copy of standard. Maintain copy at site during submittals, planning, and progress of the specific Work, until Final Completion.
- D. Should specified reference standards conflict with Contract Documents, request clarification from the Architect/Engineer before proceeding. Local code requirements, where more stringent than referenced standards, shall govern.
- E. Neither the contractual relationship, duties, nor responsibilities of the parties in Contract nor those of the Architect/Engineer shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

1.04 SCHEDULE OF REFERENCES

AA	Aluminum Association 818 Connecticut Avenue, N.W. Washington, DC 20006
AABC	Associated Air Balance Council 1000 Vermont Avenue, N.W. Washington, DC 20005
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, N.W. Washington, DC 20001
ACI	American Concrete Institute Box 19150 Reford Station Detroit, MI 48219

ADC	Air Diffusion Council 230 North Michigan Avenue Chicago, IL 60601
AGC	Associated General Contractors America 1957 E Street, N.W. Washington, DC 20006
AI	Asphalt Institute Asphalt Institute Building College Park, MD 20740
AITC	American Institute of Timber Construction 333 W. Hampden Avenue Englewood, CO 80110
AISC	American Institute of Steel Construction 400 North Michigan Avenue Eighth Floor Chicago, IL 60611
AISI	American iron and Steel Institute 1000 16th Street, N.W. Washington, DC 20036
AMCA	Air Movement and Control Association 30 West University Drive Arlington Heights, IL 60004
ANSI	American National Standards Institute 1430 Broadway New York, NY 10018
APA	American Plywood Association Box 11700 Tacoma, WA 98411
ARI	Air-Conditioning and Refrigeration Institute 1815 North Fort Myer Drive Arlington, VA 22209
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers 1791 Tullie Circle, N.E. Atlanta, GA 30329
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017
ASPA	American Sod Producers Association Association Building Ninth and Minnesota Hastings, NE 68901

ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235
AWI	Architectural Woodwork Institute 2310 South Walter Reed Drive Arlington, VA 22206
AWPA	American Wood-Preservers' Association 7735 Old Georgetown Road Bethesda, MD 20014
AWS	American Welding Society 550 LeJeune Road Miami, FL 33135
CDA	Copper Development Association 57th Floor, Chrysler Building 405 Lexington Avenue New York, NY 10174
CLFMI	Chain Link Fence Manufacturers Institute 1101 Connecticut Avenue, N.W. Washington, DC 20036
CRSI	Concrete Reinforcing Steel Institute 933 Plum Grove Road Schaumburg, IL 60195
EJMA	Expansion Joint Manufacturers Association 707 Westchester Avenue White Plains, NY 10604
FGMA	Flat Glass Marketing Association 3310 Harrison White Lakes Professional Building Topeka, KS 66611
FM	Factory Mutual System 1151 Boston-Providence Turnpike Norwood, MA 02062
FS	Federal Specification General Services Administration Specifications and Consumer Information Distribution Section (WFSIS) Washington Navy Yard, Building 197 Washington, DC 20407

GA	Gypsum Association 1603 Orrington Avenue Evanston, IL 60201
IEEE	Institute of Electrical and Electronics Engineers 345 East 47th Street New York, NY 10017
IMIAC	International Masonry Industry All-Weather Council International Masonry Institute 815 15th Street, N.W. Washington, DC 20005
MFMA	Maple Flooring Manufacturers Association 2400 East Devon Suite 205 Des Plaines, IL 60018
MIL	Military Specification Naval Publications and Forms Center 5801 Tabor Avenue Philadelphia, PA 19120
ML/SFA	Metal Lath/Steel Framing Association Metal Manufacturers 221 North LaSalle Street Chicago, IL 60601
NAAMM	National Association of Architectural Metal Manufacturers 221 North LaSalle Street Chicago, IL 60601
NEBB	National Environmental Balancing Bureau 8224 Old Courthouse Road Vienna, VA 22180
NEMA	National Electrical Manufacturers' Association 2101 L Street, N.W. Washington, DC 20037
NFPA	National Fire Protection Association Battery March Park Quincy, MA 02269
NFPA	National Forest Products Association 1619 Massachusetts Avenue, N.W. Washington, DC 20036
NSWMA	National Solid Wastes Management Association 1120 Connecticut Avenue, N.W. Washington, DC 20036
NTMA	National Terrazzo and Mosaic Association 3166 Des Plaines Avenue Des Plaines, IL 60018



PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077
PCI	Prestressed Concrete Institute 201 North Wacker Drive Chicago, IL 60606
PS	Product Standard U.S. Department of Commerce Washington, DC 20203
RIS	Redwood Inspection Service One Lombard Street San Francisco, CA 94111
RCSHSB	Red Cedar Shingle and Handsplit Shake Bureau 515 116th Avenue Bellevue, WA 98004
SDI	Steel Deck Institute Box 3812 St. Louis, MO 63122
SDI	Steel Door Institute 712 Lakewood Center North Cleveland, OH 44107
SIGMA	Sealed Insulating Glass Manufacturers Association 111 East Wacker Drive Chicago, IL 60601
SJI	Steel Joist Institute 1703 Parham Road Suite 204 Richmond, VA 23229
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 8224 Old Court House Road Vienna, VA 22180
SSPC	Steel Structures Painting Council 4400 Fifth Avenue Pittsburgh, PA 15213
TAS	Technical Aids Series Construction Specifications Institute 601 North Madison Street Alexandria, VA 22314
TCA	Tile Council of America, Inc. Box 326 Princeton, NJ 08540

UL	Underwriters' Laboratories, Inc. 333 Pfingston Road Northbrook, IL 60062
WCLIB	West Cost Lumber Inspection Bureau Box 23145 Portland, OR 97223

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01120  
ALTERATION PROJECT PROCEDURES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Procedural requirements.
- B. Rehabilitation and renovation of existing spaces and materials.

1.02 RELATED REQUIREMENTS

- A. Section 01005 - Administrative Provisions
- B. Section 01010 – Summary of Work
- C. Section 01045 - Cutting and Patching

PART 2 PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New Materials: As specified in individual Specification Sections.
- B. Match existing products and work for patching and extending Work.
- C. Determine type and quality of existing products by inspection and any necessary testing, and workmanship by use of existing as a standard. Presence of a product, finish, or type of Work, requires that patching, extending, or matching shall be performed as necessary to make Work complete and consistent with existing quality and Contract Documents.

PART 3 EXECUTION

3.01 GENERAL

- A. Remove existing work, materials and items as indicated on the Drawings, as required by job site conditions, as scheduled, and as specified herein, to accomplish new Work and alteration in the existing building.
- B. Remove work carefully and only to the extent required for the final Work. Minimize damage to adjacent materials.
- C. When portions of existing conditions are shown, it is not meant to indicate that all existing conditions are shown.
- D. Patch existing surfaces which are made defective in appearance or function by the execution of Work.
- E. Cut rigid materials using masonry saw or core drill. Pneumatic tools and electric hammers are not permitted.
- F. Conduct all operations with a minimum of noise.
- G. Take reasonable and adequate precautions to protect the Owner's property from

damage during demolition Work, moving of debris, and damage by the elements. Restore any damage to Owner property due to the aforesaid work or replace in a manner satisfactory to the Contracting Officer.

- H. Provide and maintain suitable barricades, shelters, lights, and danger signals during the progress of the Work. Provide barricades meeting the requirements of the applicable building codes. Assume the responsibility of barriers to completion of Contract and remove at completion of Contract.
- I. Locate penetrations to avoid structural members.

### 3.02 INSPECTION

- A. Verify that demolition is complete, and areas are ready for installation of new Work.
- B. Beginning of restoration Work means acceptance of existing conditions.

### 3.03 PREPARATION

- A. Plan all work in advance, informing Contracting Officer of procedure and schedule.
- B. Verify existing conditions affecting Work including existing sizes and materials indicated prior to beginning Work or ordering materials that are affected by existing conditions. Notify Contracting Officer of conflicts in writing.
- C. Erect dust-proof partitions where demolition work is in progress and as directed. Such partitions shall remain in place until their removal is directed.
- D. Where openings are to be cut in existing structures, cut such openings with care. Where materials, equipment, frames, etc., are to be removed, remove such items with care to minimize damage to adjacent materials.
- E. Cut, move, or remove items as necessary for access to alterations and renovations Work; replace and restore at completion.
- F. Cut pockets, openings, chases, depressions, etc., to install or allow for installation of materials or equipment.
- G. Remove from site unsuitable material not marked for salvage, such as rotted wood, rusted metals, and deteriorated masonry and concrete; replace materials as specified for finished Work.
- H. Remove from site, including concealed spaces, debris and abandoned items resulting from demolition operations from the site promptly. No accumulation of debris will be permitted.
- I. Prepare surfaces and remove surface finishes to provide for proper installation of new Work and new finishes.
- J. Close openings in exterior surfaces to protect existing work and salvage items from weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.

### 3.04 INSTALLATION

- A. Coordinate Work of alterations and renovations to expedite completion and to accommodate Owner occupancy. Remove, cut, and patch Work in a manner to

minimize damage and to provide means of restoring products and finishes to original condition.

- B. Refinish visible existing surfaces to remain in renovated rooms and spaces with a neat transition to adjacent new finishes.
- C. In addition to specified replacement of equipment restore existing mechanical and electrical systems to full operational condition.
- D. Install products as specified in individual Specification Sections.

### 3.05 TRANSITIONS

- A. Where new Work abuts or aligns with existing, make a smooth and even transition. Patched Work shall match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Contracting Officer.

### 3.06 ADJUSTMENTS

- A. Where removal of partitions results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads. Where a change of plane of 1/4 inch or more occurs, submit recommendation for providing a smooth transition for Contracting Officer review.
- B. Trim existing doors as necessary to clear new floor finishes; refinish trimmed areas.
- C. Fit Work at penetrations of surfaces as specified in Sections 01005 and 01045.

### 3.07 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces which are disturbed, damaged, or otherwise made defective in appearance or function by the execution of Work under this Contract. Restore to original condition.
- B. Repair substrate prior to patching finish.

### 3.08 FINISHES

- A. Finish surfaces as specified in individual Sections.
- B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

### 3.09 CLEANING

- A. In addition to cleaning specified in Section 01500, clean Owner occupied areas of Work daily.
- B. After the demolition Work in any area is completed, clean the area before new construction is started.

END OF SECTION

## **SECTION 01126 - CONTRACTOR'S CERTIFICATION OF SUBCONTRACTS**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Procedures for preparing, submitting and accepting subcontracts.

#### **1.2 RELATED REQUIREMENTS**

- A. Bidding and Contract Requirement Document 00100 - Instructions to Bidders, Requirements of Apparent Low Bidder.
- B. Bidding and Contract Requirement Document 00101 – Supplemental Information to Bidders.
- C. Bidding and Contract Requirement Document 00430 - Subcontractor List
- D. Bidding and Contract Requirement Section 00700 - General Conditions: Article 6.13 - Subcontractors.
- E. Bidding and Contract Requirement Section 00800 – Supplementary Conditions: Paragraph SC-6.13 – Replacing Subcontractors
- F. Section 01300 - Submittals: Submittal Procedures.
- G. Section 01305 – Submittal Register Form.

#### **1.3 SUBMITTALS**

- A. Submit under transmittal letter specified in Section 01300 Submittals.
- B. CONTRACTOR shall submit the initial and final Subcontractor Certification Form(s).

#### **1.4 PREPARATION OF CERTIFICATION**

- A. CONTRACTOR to prepare and sign certification forms for all subcontractors regardless of subcontract amount (see Section 00700, Paragraph 6.13.1).
- B. Submit certification form to the DEPARTMENT for approval prior to the subcontractor's start of work. Attach additional information to the certification form where required,
- C. Certification Forms: Use only forms provided by the DEPARTMENT.
- D. The DEPARTMENT will reject substitute certification forms.

#### **1.5 CONSIDERATION OF CERTIFICATION**

- A. The DEPARTMENT will review each certification form after receipt and within a reasonable period of time, for the following:
  - 1. Completeness, including the attachments.
  - 2. Proper execution (signatures), including the attachments.
  - 3. Contractor restrictions for adding subcontractors, changing subcontractors, and value of contract.
- B. The DEPARTMENT will return any submittals that are incomplete or not properly executed under a transmittal letter denoting the deficiencies found. The CONTRACTOR shall correct and resubmit according to Section 01300 Submittals.
- C. SUBCONTRACTORS NOT APPROVED BY THE DEPARTMENT SHALL NOT BE ALLOWED ON SITE.
- D. The DEPARTMENT will not process payments for work performed by a non-certified subcontractor.

**1.6 ACKNOWLEDGEMENT OF CERTIFICATION**

- A. Submittals examined by the DEPARTMENT and determined to be complete and properly executed shall be acknowledged as such by the DEPARTMENT on the approval line of the certification form and returned to the CONTRACTOR.

**1.7 CHANGES TO APPROVED SUBCONTRACTORS LIST**

- A. Deletion or replacement of subcontractors listed on approved form 06D-5, or the addition of subcontractors not listed on approved form 06D-5 shall be in accordance with Bidding and Contract Requirement Document 00101, Supplementary Information to Bidders.


**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

Not Used

**END OF SECTION 01126**

<b>STATE OF ALASKA</b> <b>Department of Health</b> <b>&amp; Social Services</b> <b>FMS Facilities</b>	<b>SUBCONTRACTOR</b> <b>CERTIFICATION</b>	
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**Note:** The Contractor shall provide this form for ALL subcontractors working on this project. This form is applicable to all projects, including Small Procurement Contracts, and must be completed in full.

PROJECT: Alaska Psychiatric Institute – Video Surveillance & CCTV Upgrades PROJ. #: ANC 22-41C-R

PRIME CONTRACTOR: \_\_\_\_\_

Pursuant to the Contract Documents, we hereby stipulate the following concerning the award of Work to the last Subcontractor on the following list:

1. First Tier Subcontractor: \_\_\_\_\_ DBE? Yes ☐ No ☐  
 Second Tier: \_\_\_\_\_ DBE? Yes ☐ No ☐  
 Third Tier: \_\_\_\_\_ DBE? Yes ☐ No ☐  
 Fourth Tier: \_\_\_\_\_ DBE? Yes ☐ No ☐
2. Date of Subcontract: \_\_\_\_\_
3. Amount of Subcontract: \$ \_\_\_\_\_
4. Scope of Work: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
5. Are the following documents kept on file by both the Contractor and the Subcontractor (check the appropriate answer)?
 

EEO-1 Certification (Form 25A304), federally funded projects only	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Contract Minimum Wage Schedule	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Civil Rights Representative (Form 25A302)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
6. Does the Subcontract contain provisions for prompt payment, release of retainage, and interest on late payment and retainage conforming to AS 36.90.210?  
 Yes ☐ No ☐
7. Does the Subcontract specifically bind the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the Department and does it contain waiver provisions and termination provisions as required by the Contract Documents?  
 Yes ☐ No ☐
8. a. Does the Subcontractor have adequate insurance coverages as specified in the Contract Documents?  
 Yes ☐ No ☐  
 If not, does the Contractor stipulate that the insurance limits of the Subcontractor are acceptable to the Contractor and that he has notified his insurance carrier of the reduced insurance limits?  
 Yes ☐ No ☐  
 b. Does the evidence of insurance certify that the policies described thereon comply with all aspects of the insurance requirements for this project?  
 Yes ☐ No ☐



Subcontractor Name: \_\_\_\_\_

c. Does the evidence of insurance list the Department as an "Additional Insured" or "Certificate Holder"?

Yes ☐ No ☐

d. Does the evidence of insurance commit to providing 30 day written notice of cancellation or reduction of any coverage?

Yes ☐ No ☐

e. Insurance Expiration dates:

Comprehensive or Commercial General Liability: \_\_\_\_\_

Automobile: \_\_\_\_\_ Workers' Compensation: \_\_\_\_\_

(Other): \_\_\_\_\_

9. Copies of the following professional certifications, licenses, and registrations are attached (circle all that apply):

Business License (mandatory)

Contractor License (mandatory)

Land Surveyor's License

Electrical Administrator's License (mandatory for electrical subs)

Mechanical Administrator's License (mandatory for mechanical subs)

Engineer/Architect

Other: \_\_\_\_\_

10. Exceptions to any of the above are explained as follows: \_\_\_\_\_

**CERTIFICATION (to be completed and signed by PRIME CONTRACTOR):** I certify all the above to be true and correct.

CONTRACTOR'S Signature: \_\_\_\_\_

CONTRACTOR'S Printed Name: \_\_\_\_\_

CONTRACTOR'S Company: \_\_\_\_\_

Date: \_\_\_\_\_

**DEPARTMENT'S APPROVAL/DISAPPROVAL**

The subject subcontract is **APPROVED**. Nothing in this approval should be construed as relieving the Prime Contractor of the responsibility for complete performance of the work or as a waiver of any right of the Department to reject defective work.

**SIGNATURE:** \_\_\_\_\_ **DATE:** \_\_\_\_\_  
Amy Burke, Contracting Officer

The subject subcontract is **NOT APPROVED** for the following reasons:

\_\_\_\_\_  
\_\_\_\_\_

**SIGNATURE:** \_\_\_\_\_ **DATE:** \_\_\_\_\_  
Project Manager

SECTION 01200  
PROJECT MEETINGS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. CONTRACTOR participation in preconstruction conferences.
- B. CONTRACTOR administration of progress meetings.

1.02 RELATED REQUIREMENTS

- A. Document 00120 - Supplementary Instructions to Bidders: Pre-Bid Conference.
- B. Section 01010 – Summary of Work: Coordination.
- C. Section 01300 - Submittals: Construction Progress Schedules, Shop drawings, Product data, and Samples.
- D. Section 01400 - Quality Control.
- E. Section 01700 - Contract Closeout: Project Record Documents, Operation and Maintenance Data.

1.03 PRECONSTRUCTION CONFERENCES.

- A. DEPARTMENT will administer preconstruction conference for execution of Contract and exchange of preliminary submittals and review of administrative procedures.
- B. DEPARTMENT will administer site mobilization conference at Project site for clarification of CONTRACTOR responsibilities in use of site and coordination with Using Agency for occupancy throughout the duration of the work. CONTRACTOR shall provide the detailed written work plan in preparation for this meeting.

1.04 PROGRESS MEETINGS

- A. Contractor shall schedule and administer weekly Project meetings throughout progress of the Work (unless this requirement is waived by the Project Manager), and other meetings as required to coordinate work, and preinstallation conferences.
- B. Attendance: Job superintendent, major Subcontractors and Suppliers; DEPARTMENT and Consultants as appropriate to agenda topics for each meeting.
- C. Minimum Required Agenda: Review of Work progress, status of progress schedule and adjustments thereto, Work anticipated in the next week, delivery schedules, submittals, maintenance of quality standards, pending changes and substitutions, and other items affecting progress of Work.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

END OF SECTION

SECTION 01230  
ALTERNATES

PART 1 GENERAL

1.01 SUMMARY

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

1.02 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
  - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.03 PROCEDURES

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

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 SCHEDULE OF ALTERNATES

- A. Not Applicable to this project

END OF SECTION

SECTION 01300  
SUBMITTALS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Procedures.
- B. Construction Progress Schedules.
- C. Schedule of Values.
- D. Shop Drawings, Product Data, and Samples.
- E. Field Samples.

1.02 RELATED REQUIREMENTS

- A. Section 01010 - Summary of Work.
- B. Section 01027 - Applications for Payment.
- C. Section 01400 - Quality Control: Manufacturers' Field Services, Testing Laboratory Services.
- D. Section 01600 - Material and Equipment: Products List.
- E. Section 01700 - Contract Closeout: Closeout Procedures.

1.03 PROCEDURES

- A. Deliver submittals to DEPARTMENT as directed.
- B. Transmit each item under DEPARTMENT accepted form. Identify Project, CONTRACTOR, Subcontractor, Major Supplier, identify pertinent Drawing sheet and detail number, and Specification section number, as appropriate. Identify deviations from Contract Documents by submitting a DEPARTMENT supplied Substitution Request Form. Provide a minimum of 8 1/2" x 5 1/2" blank space on the front page for CONTRACTOR, and Consultant review stamps.
- C. Submit initial progress schedules and Schedule of Values in five copies in accordance with paragraph SC6.6 of Document 00800 - Supplementary Conditions prior to submitting first Application for Payment. Form and content shall be reviewed by the DEPARTMENT. After review by DEPARTMENT revise and resubmit as required. Submit subsequent updated schedules (10) days prior to each Application for Payment.
- D. Comply with progress schedule for submittals related to Work progress. Coordinate submittal of related items.
- E. After DEPARTMENT review of submittal, revise and resubmit as required, identifying changes made since previous submittal. Provide total number of submittals as required for the first submission, if 6 are required and 4 were returned for revisions, submit 6 again. The DEPARTMENT and Consultants will not return the first or revised copies of rejected submittals for re-use. DO NOT submit partial copies of submittals for incorporation into rejected submittal packages which have been kept by the DEPARTMENT and/or Consultants. Provide COMPLETE copies for each review.
- F. If drawings, product submittals, samples, mock-ups, or other required submittals are incomplete or not properly submitted, the DEPARTMENT will not review the submittal

and will immediately return submittal to CONTRACTOR. DEPARTMENT will review a submittal no more than three times (incomplete or improper submittals count as one). CONTRACTOR shall pay all review costs associated with more than three reviews, unless a resubmittal is required due to new comments addressing previously submitted information.

#### 1.04 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit horizontal bar Gantt chart (see below for electronic version requirements). Schedule shall show:

1. Separate bar for each major trade or operation, identifying the duration of each activity and precedent activities.
2. Complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Show each work plan and separate work area as a separate activity or group of activities.
3. Submittal dates for required for Shop Drawings, product data, and samples, and product delivery dates, including those furnished by DEPARTMENT and those under allowances.
4. All required submittals and indicating the date for each required submittal.
5. Show projected percentages of completion for each item of Work and submittal as of time of each Application for Progress Payment. See below for electronic version requirements.
6. **ELECTRONIC VERSION: REQUIRED FOR ALL PROJECTS WHEN THE ORIGINAL CONTRACT AMOUNT IS EQUAL TO OR GREATER THAN \$500,000.00.** Submit Progress Schedule plotted on paper no larger than 24" x 36" and no smaller than 8 1/2" x 11" from the electronic program. Provide in electronic form on CD for IBM and compatible using Microsoft Project 2000 version 9.0. CD will not be returned by the DEPARTMENT.
7. Submit Progress Schedule percentages in Tracking Gantt form plotted from and in electronic form as stated above.

#### 1.05 SCHEDULE OF VALUES

A. FORMAT

1. Form and content must be acceptable to DEPARTMENT.
2. CONTRACTOR's standard form or media-driven printout will be considered on request.
3. Follow table of contents of Project manual for listing component parts. Identify each line item by number and title of listed Specification sections.

B. CONTENT

1. List installed value of each major item of Work and each subcontracted item of Work as a separate line item to serve as a basis for computing values for progress payments. Round off values to nearest dollar.
2. For each major subcontract, list products and operations of that subcontract as separate line items.
3. Coordinate listings with progress schedule.
4. Component listings shall each include a directly proportional amount of

CONTRACTOR's overhead and profit.

5. For items on which payments will be requested for stored products, list sub-values for cost of stored products with taxes paid.
6. Specific line item Values as indicated below shall be minimum acceptable amounts and must be included on all approved Schedules of Values and Applications for Payment.
  - a. **Section 01700 - Contract Closeout. Value of all required Substantial Completion Submittals and Closeout Submittals shall be not less than 10% of the final contracted amount.**
  - b. No progress payments will be made for Substantial Completion Submittals and Closeout Submittals until **all** submittals have been submitted to and accepted by the DEPARTMENT.
7. The sum of values listed shall equal total Contract Price.

C. SUBMITTAL

1. Submit four copies of Schedule prior to submitting the CONTRACTOR's first Application for Payment. Subsequent updated Schedule of Values shall be presented for review ten days prior to each Application for Payment.
2. Transmit under DEPARTMENT accepted form transmittal letter. Identify Project by DEPARTMENT title and Project number; identify Contract by DEPARTMENT Contract number.

D. SUBSTANTIATING DATA

1. When DEPARTMENT requires substantiating information, submit data justifying line item amounts in question.
2. Provide one copy of data with cover letter for each copy of the Application for Payment. Show application number and date, and line item by number and description.

1.06 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

A. SHOP DRAWINGS:

1. Present in a clear and thorough manner. Label each Shop Drawing with DEPARTMENT's Project name and Project number; identify each element of the Shop Drawings by reference to sheet number and detail, schedule, or room number of Contract Documents.
2. Identify field dimensions; show relation to adjacent or critical features or Work or products.
3. Minimum Sheet Size: 8-1/2"x11". Larger sheets may be submitted in multiples of 8-1/2"x11".

B. PRODUCT DATA

1. Submit only pages which are pertinent; mark each copy of standard printed data to identify pertinent products, referenced to Specification section and Article number. Show reference standards, performance characteristics, and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions; and required clearances.
2. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the Work.

Delete information not applicable.

C. SAMPLES

1. Submit full range of manufacturer's standard finishes except when more restrictive requirements are specified, indicating colors, textures, and patterns, for DEPARTMENT selection.
2. Submit samples to illustrate functional characteristics of products, including parts and attachments.
3. Approved samples, which may be used in the Work, are indicated in the Specification section.
4. Label each sample with identification required for transmittal letter.
5. Provide field samples of finishes at Project, at location acceptable to DEPARTMENT, as required by individual Specification section. Install each sample complete and finished. Acceptable finishes in place may be retained in completed Work.

D. MANUFACTURER'S INSTRUCTIONS

1. When required in individual Specification Section, submit manufacturer's printed instructions for delivery, storage, assembly, installation start-up, adjusting, and finishing, in quantities specified for product data.
2. Manufacturer's instructions for storage, preparation, assembly, installation, start-up, adjusting, balancing, and finishing under provisions of Section 01400.

E. CONTRACTOR REVIEW

1. Review submittals prior to transmittal; determine and verify field measurements, field construction criteria, manufacturer's catalog numbers, and conformance of submittal with requirements of Contract Documents.
2. Coordinate submittals with requirements of Work and of Contract Documents.
3. Sign or initial each sheet of Shop Drawings and product data, and each sample label to certify compliance with requirements of Contract Documents. Notify DEPARTMENT in writing at time of submittal, of any deviations from requirements of Contract Documents.
4. Do not fabricate products or begin Work that requires submittals until return of submittal with DEPARTMENT acceptance.

F. SUBMITTAL REQUIREMENTS

1. Each submittal to be numbered by Specification Section and Paragraph. Revisions shall be identified by a hyphen after the paragraph, with a letter designator. Example: 1st submittal "01010 1.08A" 2nd submittal 01010 1.08A - A".
2. Transmit submittals in accordance with the required submittal schedule and in such sequence to avoid delay in the Work.
3. Provide 8 1/2" x 5 1/2" blank space on each submittal for CONTRACTOR and Consultant stamps.
4. Apply CONTRACTOR'S stamp, signed or initialed, certifying to review, verification of products, field dimensions and field construction criteria, and coordination of information with requirements of Work and Contract Documents.
5. Coordinate submittals into logical groupings to facilitate interrelation of the several items:

- a. Finishes which involve DEPARTMENT selection of colors, textures, or patterns.
  - b. Associated items that require correlation for efficient function or for installation.
6. Submit number of opaque reproductions of shop drawings CONTRACTOR requires, plus six that will be retained by DEPARTMENT.
7. Submit number of copies of product data and manufacturer's instructions CONTRACTOR requires, plus three copies, which will be retained by DEPARTMENT.
8. Submit number of samples specified in individual Specifications sections.
9. Submit under DEPARTMENT accepted transmittal form letter. Identify Project by title and DEPARTMENT Project number; identify Contract by DEPARTMENT contract number. Identify Work and product by Specification section and Article number.
10. Each submittal shall have as its face document a completed DEPARTMENT furnished Submittal Summary form.
11. Each submittal shall include the manufacturer's name and address, and supplier's name, address and telephone number.

#### G. RESUBMITTALS

1. After DEPARTMENT review of submittal, revise and resubmit as required, identifying changes made since previous submittal. Provide total number of submittals as required for the first submission, if 6 are required and 4 were returned for revisions, submit 6 again. The DEPARTMENT and Consultants will not return the first or revised copies of rejected submittals for re-use. DO NOT submit partial copies of submittals for incorporation into rejected submittal packages which have been kept by the DEPARTMENT and/or Consultants. Provide COMPLETE copies for each review.

#### H. DEPARTMENT REVIEW

1. DEPARTMENT or authorized agent will review Shop Drawings, product data, and samples and return submittals within (14) working days.
2. DEPARTMENT or authorized agent will examine shop drawings for general arrangement, overall dimensions and suitability, and will return to the CONTRACTOR marked as follows;
  - "No Exceptions Taken" - denotes that the submittal generally meets the requirements of the Contract Documents. "No Exceptions Taken" does not indicate a review of the CONTRACTOR's design except for general compliance with the requirements of the Contract Documents.
  - "Make Corrections Noted" - denotes review is conditional on compliance with notes made on the submittal.
  - "Revise and Resubmit" - denotes that revisions are required in the submittal in order for the submittal to be generally consistent with the requirements of the Contract Documents. Required revisions will be



identified to the CONTRACTOR.

- "Rejected" - denotes that the submittal does not meet the requirements of the Contract Documents and shall not be used in the Work. Reasons for rejection will be identified to the CONTRACTOR.

3. Review by the DEPARTMENT of shop and erection drawings shall not be construed as a complete check, but will indicate only that the general method of construction and detailing is consistent with the requirements of the Contract Documents. Review of such drawings shall not relieve the CONTRACTOR of the responsibility for errors, dimensions, and detail design.
4. DEPARTMENT will require submittal of all required color and finish samples in order to approve any on color or finish.

I. DISTRIBUTION

1. Duplicate and distribute reproductions of Shop Drawings, copies of product data, and samples, which bear Consultant's stamp, to job site file, record documents file, Subcontractors, Suppliers, and other entities requiring information.

J. SCHEDULE OF SUBMITTALS

1. Submittal Register Form to be completed by CONTRACTOR and approved by DEPARTMENT prior to submittal of any items.
2. Submit shop drawings, product data and samples as required for each specification section.
3. Format.

a. Submittal schedule form as provided by DEPARTMENT.

1.07 FIELD SAMPLES

- A. Provide field samples of finishes at Project as required by individual Specifications section. Install sample complete and finished. Acceptable samples in place may be retained in completed Work.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

END OF SECTION

SECTION 01400  
QUALITY CONTROL

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. General Quality Control.
- B. Workmanship.
- C. Manufacturer's Instructions.
- D. Manufacturer's Certificates.
- E. Mockups.
- F. Manufacturers' Field Services.
- G. Testing Laboratory Services.
- H. Departmental Inspection Services.

1.02 RELATED REQUIREMENTS

- A. Document 00700 - General Conditions: Inspection and testing required by governing authorities.
- B. Section 01010 – Summary of Work: Work Plans and Access to Facility, Individual Work Areas, and Tests required for inspection of the existing roof deck and structural members.
- C. Section 01090 - Reference Standards: Applicability of Reference Standards.
- D. Section 01300 - Submittals: Shop Drawings, Product Data, and Samples

1.03 QUALITY CONTROL, GENERAL

- A. Maintain quality control over Suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

1.04 WORKMANSHIP

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform Work by persons qualified to produce workmanship of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.05 MANUFACTURERS' INSTRUCTIONS

- A. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from DEPARTMENT before proceeding.

1.06 MANUFACTURERS' CERTIFICATES

- A. When required by individual Specifications section, submit manufacturer's certificate, in duplicate, that products meet or exceed specified requirements.

1.07 MOCKUPS

- A. When required by individual Specifications section, erect complete, full-scale mockup of assembly at site, perform required tests, and remove mockup at completion, when approved by DEPARTMENT.

1.08 MANUFACTURERS' FIELD SERVICES

- A. When required by manufacturer or when specified in respective Specification sections, require manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to make appropriate recommendations.
- B. Require manufacturer's representative to submit written report to DEPARTMENT listing observations and recommendations.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

END OF SECTION

SECTION 01500  
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Electricity, Lighting.
- B. Heat, Ventilation.
- C. Telephone Service.
- D. Water.
- E. Sanitary Facilities.
- F. Dust Control (Exterior).
- G. Construction Enclosures.
- H. Barriers.
- I. Barricades, Warnings, and Markings (Airport Operations).
- J. Protection of Installed Work.
- K. Security.
- L. Water Control.
- M. Cleaning During Construction.
- N. Removal.
- O. Waste Storage Equipment.
- P. Cleaning of the Project Area.
- Q. Disposal.
- R. Tool Control

1.02 RELATED REQUIREMENTS

- A. Section 01010 - Summary of Work: Use of Premises.
- B. Section 01010 - Summary of Work: Shutoffs and Disruptions to Service.
- C. Section 01540 - Security.
- D. Section 01700 - Contract Closeout: Final cleaning.

1.03 ELECTRICITY, LIGHTING

- A. Connect to existing service, provide branch wiring and distribution boxes located to allow service and lighting by means of construction-type power cords. DEPARTMENT will pay costs of energy used.
- B. Provide lighting for construction operations.
- C. Take precautions to conserve energy. Wasteful use of power will be back charged to the CONTRACTOR.

1.04 HEAT, VENTILATION

- A. Provide as required to maintain specified conditions for construction operations, to protect materials and finishes from damage due to temperature or humidity.
- B. Do not use permanent facilities for temporary purposes.
- C. Fully exhaust to the outside welding fumes generated from operations related to performance of the Work.
- D. Provide ventilation of enclosed areas to cure materials, to disperse humidity, and to prevent accumulations of dust, fumes, vapors, or gases.

1.05 TELEPHONE SERVICE

- A. Provide telephone service if required for construction operations.

1.06 WATER

- A. Provide service required for construction operations. Extend branch piping with outlets located so that water is available by use of hoses.
- B. The DEPARTMENT will pay for water used.
- C. Hoses or temporary piping will not be permitted in public areas where a hazard to the public may be created.

1.07 SANITARY FACILITIES

- A. Designated existing facilities may be used during construction operation; maintain in clean sanitary condition. Do not use facilities for construction for cleaning of construction equipment.

1.08 DUST CONTROL

- A. Execute Work by methods that minimize raising of dust or airborne debris from construction or demolition operations
- B. Provide positive means to prevent air-borne dust from dispersing into the atmosphere

1.09 CONSTRUCTION ENCLOSURES

- A. Provide temporary enclosures/partitions around areas inside the facility that are affected by the construction. Enclosures/partitions shall:
  - 1. Isolate construction from Using Agency and residents. Enclosure/partitions must be secured with a padlock.
  - 2. Prevent the penetration of dust and/or moisture into occupied areas. Partitions must be sealed at ceiling and floor.
  - 3. Prevent damage to existing materials, finishes, and equipment or other existing building components and contents.
  - 4. Be designed and stamped by an engineer licensed by the State of Alaska if over 12 feet high.
  - 5. Be constructed of metal studs, painted GWB, 10 mil polyethylene, and sound attenuation insulation. Enclosures/Partitions shall extend from floor to ceiling with complete closure at adjoining walls.

- B. The CONTRACTOR shall include his plan for construction enclosures in the work plan prepared under Section 01010.

#### 1.10 BARRIERS

- A. Provide as required to prevent public entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide barriers to provide both separation and safety to adjacent building occupants..

#### 1.11 PROTECTION OF INSTALLED WORK

- A. Provide temporary protection for installed products. Control traffic in immediate area to minimize damage.
- B. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings. Protect finished floors and stairs from traffic, movement of heavy objects, and storage.

#### 1.12 SECURITY.

- A. Provide security program and facilities to protect Work, existing facilities, and Using Agency's operations from unauthorized entry, vandalism, and theft. Coordinate with DEPARTMENT security program.

#### 1.13 WATER CONTROL

- A. Protect the interior of the facility from water and/or moisture infiltration

#### 1.14 CLEANING DURING CONSTRUCTION

- A. In accordance with Part 2 and Part 3 of this specification.

#### 1.15 REMOVAL

- A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary facilities.
- C. Restore existing facilities used during construction to specified, or to original, condition.

### PART 2 PRODUCTS

#### 2.01 WASTE STORAGE EQUIPMENT

- A. Provide covered containers for deposit of materials, waste materials, debris, and rubbish.

### PART 3 EXECUTION

#### 3.01 CLEANING OF THE PROJECT AREA

- A. Maintain all areas under CONTRACTOR's control free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to closing the space.
- C. Immediately clean interior areas after completion of the work to provide suitable conditions for building occupants and residents. All resident occupied areas and areas used by the general public require cleanup at the end of each shift.

- D. Broom clean interior areas prior to start of surface finishing, and continue cleaning on an as needed basis.
- E. Control cleaning operations so that dust and other particulates will not adhere to wet or newly-coated surfaces.

3.02 DISPOSAL

- A. Promptly remove waste materials, debris, and rubbish from site periodically and dispose of in accordance with all Federal, State and local regulations.

END OF SECTION

SECTION 01540  
SECURITY

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Security Check
- B. Facility Liaison
- C. Personnel Access
- D. Contraband
- E. Tool Control

1.02 RELATED REQUIREMENTS

- A. Section 01010 - Summary of Work.
- B. Section 01500 - Construction Facilities and Temporary Controls.

PART 2 PRODUCTS Not Used.

PART 3 EXECUTION

3.01 SECURITY CHECK

- A. All personnel will be required to undergo a security check prior to commencement of work.
- B. The security check will look for recent or frequent past convictions or for outstanding warrants. The Department of Health & Social Services reserves the right to disqualify anyone from access to the work site. A past conviction will not automatically disqualify.

3.02 FACILITY LIAISON

- A. A staff person will be assigned to act as the liaison with the contractor and the facility.
- B. In the event of an emergency affecting the secure operations of the youth facility, the liaison is authorized to direct the contractor to take appropriate action. The directions of the liaison will be followed immediately. This provision supplements Article 6.19 of the General Conditions of the construction contract for facilities.
- C. The liaison shall be briefed each week by the contractor regarding the contractor's work requirements and weekly work plan for the subsequent week.

3.03 PERSONNEL ACCESS

- A. All access to the work site, which is within a youth facility, will be monitored and controlled by the Department of Health & Social Services in order to prevent importation of contraband and escape of residents.
- B. Contractors, subcontractors, and employees may be denied access or be removed from the facility for the following reasons:
  - 1. Contractors or workers that are incompetent, careless or otherwise detrimental to the work or the security of the facility.
  - 2. Security requirements.
  - 3. Disruptive, abrasive, and/or argumentative conduct.



4. Possession or being under the influence of alcohol, drugs and/or any substance that is considered contraband by the facility (including use of tobacco products).
5. Refusal to submit to search of personal property/belongings or themselves.
6. Health problems.
7. Failure to show proper identification.
8. Failure to follow the direction of youth facility officers and/or staff members.
9. Having any contact or interaction with inmates.
10. Failure to pass security check.

### 3.04 CONTRABAND

- A. The mailing, bartering, introducing, exchanging, or buying of items between residents and contractors or their employees is strictly prohibited without the written consent of the superintendent of the institution.

**Title II - Alaska Statutes Section 11.56.375. Promoting contraband in the first degree.**

- (1) A person commits the crime of promoting contraband in the first degree if the person violates AS 11.56.380 and the contraband is
  - (2) a deadly weapon;
  - (3) an article that is intended by the defendant to be used as a means of facilitating an escape; or
  - (4) a controlled substance.
- B. Promoting contraband in the first degree is a class C felony

**Section 11.56.380. Promoting contraband in the second degree.**

- a. A person commits the crime of promoting contraband in the second degree if the person:
- (1) introduces, takes, conveys, or attempts to introduce, take or convey contraband into a facility; or
  - (2) makes, obtains, possesses, or attempts to make, obtain, or possess anything that person knows to be contraband while under official detention within a correctional facility.
- b. Promoting contraband in the second degree is a class A misdemeanor.

**Section 11.56.390. Definition.**

In AS 11.56.300 - 11.56.390, "contraband" means any article or thing which persons confined in a correctional facility are prohibited by law from obtaining, making, or possessing in that correctional facility.

- C. Contractor is hereby advised that all personnel working at the site will be required to sign a statement that they fully understand sections 3.03 and 3.04 referenced above.

### 3.05 TOOL CONTROL

- A. Do not leave accessible work areas of the youth facility unattended without first removing or securing all tools and objects which would be considered contraband. Tools will be confiscated and the contractors' personnel responsible will be removed from the site.

3.06 DEPARTMENT OF HEALTH & SOCIAL SERVICES  
DIVISION OF JUVENILE JUSTICE YOUTH CORRECTION SECURITY CLEARANCE  
PROCEDURES

- A. The following documents pertain to mandatory security background checks for anyone going to work inside a youth detention facility. This is a requirement and the paperwork must be processed prior to anyone going to work at the facility.

The completed forms are to be sent to the following address:

Johnson Youth Center  
3252 Hospital Drive  
Juneau, AK 99801  
ATTN: August Campos, Maintenance Foreman

Phone: (907) 523-6848 / Fax (907) 586-2680

Please direct any questions or comments concerning the security section to Mr. Campos at the referenced phone number.

SECTION 01600  
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Products.
- B. Transportation and Handling.
- C. Storage and Protection.
- D. Product Options.
- E. Products List.
- F. Substitutions.

1.02 RELATED REQUIREMENTS

- A. Section 01005 - Administrative Provisions.
- B. Section 01010 - Summary of Work.
- C. Section 01090 - Reference Standards.
- D. Section 01400 - Quality Control: Manufacturers' Certificates.
- E. Section 01700 – Contract Closeout: Closeout Procedures, Operation and Maintenance Data, Warranties, Spare Parts and Maintenance Materials.

1.03 PRODUCTS

- A. Products include material, equipment, and systems.
- B. Comply with Specifications and referenced standards as minimum requirements.
- C. Components required to be supplied in quantity within a Specification section shall be the same, and shall be interchangeable.
- D. Do not use materials and equipment removed from existing structure, except as specifically required, or allowed, by Contract Documents.

1.04 TRANSPORTATION AND HANDLING

- A. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
- C. Immediately on delivery, inspect shipment to assure:
  - 1. Product complies with requirements of Contract Documents and reviewed submittals.
  - 2. Quantities are correct.
  - 3. Accessories and installation hardware are correct.
  - 4. Containers and packages are intact and labels legible.
  - 5. Products are protected and undamaged.

## 1.05 STORAGE AND PROTECTION

- A. **HANDLE AND STORE MATERIALS FOR CONSTRUCTION, PRODUCTS OF DEMOLITION, AND OTHER ITEMS TO AVOID DAMAGE TO BUILDING.**
- B. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.
- C. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions.
- D. Provide Material Safety Data Sheets (MSDS) for all products which may produce unpleasant or noxious odors. CONTRACTOR shall provide for adequate venting if needed.

## 1.06 OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards.
- B. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions by meeting product description: Submit a request for substitution for any manufacturer not specifically named that meets the product description specifications.
- C. Products Specified by Naming One or More Manufacturers followed by the term "No Substitutions": Use only specified manufacturers, no substitutions allowed.

## 1.07 PRODUCTS LIST

- A. Within 7 days after date of Notice to Proceed, transmit four copies of a list of products, which are proposed for installation, including name of manufacturer.
- B. Tabulate products by Specifications section number, title, and Article number
- C. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.
- D. DEPARTMENT will reply in writing within five days stating whether there is reasonable objection to listed items. Failure to object to a listed item shall not constitute a waiver of requirements of Contract Documents.

## 1.08 SUBSTITUTIONS

- A. SUBSTITUTION SUBMITTAL PERIOD
  - 1. Product substitution requests will be considered only within 7 days after date established in Notice to Proceed. Subsequent requests will be considered only in case of product unavailability or other conditions beyond control of CONTRACTOR. (Submit on Substitution Request Form "B")
- B. LIMITATIONS ON SUBSTITUTIONS
  - 1. **Only one request for substitution will be considered for each product** from each Prime Bidder/CONTRACTOR. When substitution is not accepted, Prime Bidder/CONTRACTOR shall provide specified product.
  - 2. Substitutions will not be considered when indicated on Shop Drawings or product data submittals.
  - 3. Substitute products shall not be ordered or installed without written acceptance.
  - 4. DEPARTMENT will determine acceptability of substitutions.
- C. REQUESTS FOR SUBSTITUTIONS
  - 1. Submit separate request for each substitution. Document each request with

complete data substantiating compliance of proposed substitution with requirements of Contract Documents.

2. Identify product by Specification section and Article numbers. Provide manufacturer's name and address, trade name of product, and model or catalog number. List fabricators and Suppliers as appropriate.
3. Attach product data as specified in Section 01340.
4. List similar projects using product, dates of installation, and names of design Consultant(s) and owner.
5. Give itemized comparison of proposed substitution with specified product, listing variations, and reference to Specification sections and Article numbers.
6. Give quality and performance comparison between proposed substitution and the specified product.
7. Give cost data comparing proposed substitution with specified product, and amount of net change to Contract Price.
8. List availability of maintenance services and replacement materials.
9. State effect of substitution on construction schedule, and changes required in other Work or products.

D. CONTRACTOR REPRESENTATION

1. Request for substitution constitutes a representation that CONTRACTOR has investigated proposed product and has determined that it is equal to or superior in all respects to specified product.
2. CONTRACTOR will provide same warranty for substitution as for specified product.
3. CONTRACTOR will coordinate installation of accepted substitute, making such changes as may be required for Work to be complete in all respects.
4. CONTRACTOR certifies that cost data presented is complete and includes all related costs under this Contract.
5. CONTRACTOR waives claims for additional costs related to substitution which may later become apparent.

E. SUBMITTAL PROCEDURES

1. Submit five copies of complete request for Substitution Request Form. Request to include complete product information and data, color swatch board, and certification that proposed product meets or exceeds all requirements for the specified product.
2. DEPARTMENT will review CONTRACTOR's requests for substitutions within 5 days of receipt.
3. After receipt of submittal, DEPARTMENT will notify CONTRACTOR, in writing, of decision to accept or reject requested substitution within 5 days.
4. For accepted products, submit Shop Drawings, product data, and samples under provisions of Section 01300.

PART 2 PRODUCTS  
PART 3 EXECUTION

Not Used  
Not Used

Alaska Psychiatric Institute  
DDC Upgrades  
ANC 22-57C

Section 01600

Material and Equipment

END OF SECTION

SECTION 01700  
CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Closeout Procedures.
- B. Final Cleaning.
- C. Project Record Documents.
- D. Operation and Maintenance Data.
- E. Warranties.
- F. Spare Parts and Maintenance Materials.
- G. Maintenance Service.

1.02 RELATED REQUIREMENTS

- A. Document 00700 - General Conditions: Fiscal provisions, legal submittals, and other administrative requirements.
- B. Section 01010 - Summary of Work: Using Agency Occupancy.
- C. Section 01400 – Quality Control: Departmental Inspection Services.
- D. Section 01500 - Construction Facilities and Temporary Controls: Cleaning during construction.

1.03 CLOSEOUT PROCEDURES

- A. Substantial Completion and Final Completion:
  - 1. Substantial Completion:
    - a. Submit the following prior to requesting a Substantial Completion Inspection:
      - 1. Evidence of Compliance with Requirements of Governing Authorities:
        - I. Certificate of Occupancy.
        - II. Required Certificates of Inspection.
      - 2. Project Record Documents in accordance with sub section 1700-1.05
      - 3. Operation and Maintenance Data in accordance with sub section 1700-1.06
      - 4. Spare Parts and Maintenance Materials in accordance with sub section 1700-1.08
    - b. Substantial Completion shall be considered by the DEPARTMENT when:
      - 1. Written notice is provided 7 days in advance of inspection date.
      - 2. List of items to be completed or corrected is submitted.
      - 3. Operation and Maintenance Manuals are submitted and approved by the DEPARTMENT.
      - 4. Equipment and systems have been tested, adjusted, balanced and are fully operational.
      - 5. Automated and manual controls are fully operational.
      - 6. Operation of system has been demonstrated to DEPARTMENT

Personnel.

7. Certificate of Occupancy is submitted.
  8. Certificates of Inspection for required inspections have been submitted.
  9. Project Record Documents for the Work or the portion of the Work being accepted are submitted and approved.
  10. Spare parts and maintenance materials are turned over to DEPARTMENT.
  11. All keys are turned over to the DEPARTMENT.
- c. Should the DEPARTMENT inspection find Work is not substantially complete, the Department will promptly notify CONTRACTOR in writing, listing observed deficiencies.
  - d. The CONTRACTOR shall remedy deficiencies and send a second written notice of Substantial Completion.
  - e. When the DEPARTMENT finds Work is substantially complete the DEPARTMENT will prepare a certificate of Substantial Completion in accordance with provisions of General Conditions

**B. FINAL COMPLETION:**

1. When CONTRACTOR considers Work is complete, submit written certification that:
  - a. Contract Documents have been reviewed.
  - b. Work has been inspected for compliance with Contract Documents.
  - c. Work has been completed in accordance with Contract Documents, and deficiencies listed with certificate of Substantial Completion have been corrected.
  - d. Work is complete and ready for final inspection.
2. Should the DEPARTMENT inspection find Work incomplete, DEPARTMENT will promptly notify CONTRACTOR in writing listing observed deficiencies.
3. CONTRACTOR shall remedy deficiencies and send a second certification of Final Completion.
4. When DEPARTMENT finds Work is complete, DEPARTMENT will consider closeout submittals.

**C. REINSPECTION FEES**

1. Should status of completion of Work require more than two re-inspections by the DEPARTMENT due to failure of Work to comply with CONTRACTOR's responsibility, the DEPARTMENT will deduct the cost of re-inspection from final payment to CONTRACTOR as provided in the Contract Documents.
2. Re-inspection fees shall not exceed \$5,000 for any one re-inspection.

**D. CLOSEOUT SUBMITTALS**

1. Warranties and Bonds: Under provisions of Section 01700.
2. Evidence of Payment: In accordance with Conditions of the Contract.
3. Consent of Surety to Final Payment.
4. Certificates of Insurance for Products and Completed Operations: In accordance with Supplementary Conditions.



5. Certificate of Release.

E. APPLICATION FOR FINAL PAYMENT

1. Submit application for final payment in accordance with provisions of the General Conditions of the Contract.
- F. Using Agency will occupy Facility for the purpose of conduct of business, under provision stated in certificate of Substantial Completion.
- G. DEPARTMENT will issue a summary Change Order reflecting final adjustments to Contract Price not previously made by Change Order.

1.04 FINAL CLEANING

- A. Execute final cleaning prior to Substantial Completion inspection.
- B. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment. Clean roofs, gutters, downspouts, and drainage systems.
- C. Clean site; sweep paved areas, rake clean other surfaces.
- D. Use materials which will not create hazards to health or property, and which will not damage surfaces. Follow manufacturers' recommendations.
- E. Maintain cleaning until the DEPARTMENT issues certificate of substantial Completion.
- F. Remove waste, debris, and surplus materials from the site. Clean grounds; remove stains, spills, and foreign substances from paved areas and sweep clean. Rake clean other exterior surfaces.

1.05 PROJECT RECORD DOCUMENTS

- A. Maintain on site, one set of the following Record Documents; record actual revisions to the Work:
  1. Drawings.
  2. Specifications.
  3. Addenda.
  4. Change Orders and other modifications to the Contract.
  5. Reviewed shop drawings, product data, and samples.
  6. Manufacturers instructions for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by DEPARTMENT.
- C. Store Record Documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. SPECIFICATIONS: Legibly mark and record at each product section description of actual products installed, including the following:
  1. Manufacturer's name and product model and number.
  2. Product substitutions or alternates utilized.
  3. Changes made by Addenda and Modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction graphically to scale including:

1. Measured depths of foundations in relation to finish first floor datum.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
4. Field changes of dimension and detail.
5. Details not on original Contract drawings.

#### 1.06 OPERATION AND MAINTENANCE INSTRUCTIONS

- A. Submit data bound in 8-1/2 by 11 inch (A4) text pages, 3-D side ring binders with durable plastic covers.
- B. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are requested.
- C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with the tab titling clearly printed under reinforced laminated plastic tabs.
- D. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, typed on 24 pound white paper, in 3 parts as follows:
  1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, CONTRACTOR, subcontractors, and major equipment suppliers.
  2. Part 2: Operations and maintenance instructions, arranged by system and subdivided by Specification Section. For each category, identify names, addresses, and telephone numbers of subcontractors and suppliers. Identify the following:
    - a. Significant design criteria.
    - b. List of equipment.
    - c. Parts list for each component.
    - d. Operating instructions.
    - e. Maintenance instructions for equipment and systems.
    - f. Maintenance instructions for [special] finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
  3. Part 3: Project Documents and Certificates, including the following:
    - a. Shop drawings and product data.
    - b. Certificates.
    - c. Originals of warranties and bonds.
- E. Submit one draft copy of completed volumes five working days prior to Substantial Completion inspection. This copy will be reviewed and returned, with DEPARTMENT comments. Revise content of all document sets as required prior to final submission.
- F. Submit two sets of revised final volumes and a digital copy on a CD Rom disc within ten days after Substantial Completion Inspection.

#### 1.07 WARRANTIES

- A. As a condition precedent to Final Payment, all guaranties and warranties as specified under various sections of the Contract Documents shall be obtained by the CONTRACTOR and

delivered to the OWNER, in duplicate giving a summary of guarantees attached and stating the following in respect to each:

1. Character of Work affected.
  2. Name of Subcontractors.
  3. Period of Guarantee.
  4. Conditions of Guarantee.
- B. Delivery of said guarantees and/or warranties shall not relieve the CONTRACTOR from any obligations assumed under any other provision of the Contract.
- C. If, within any guarantee period, repairs or changes are required in connection with the guaranteed Work, which in the opinion of the OWNER is rendered necessary as the result of the use of materials, equipment or workmanship, which are defective, or inferior, or not in accordance with the terms of the Contract, the CONTRACTOR shall, upon receipt of notice from the OWNER, and without expense to the OWNER, proceed within seven (7) calendar days to:
1. Place in satisfactory conditions in every particular all of such guaranteed Work, correct all defects therein, and make good all damages to the structure or site.
  2. Make good all Work or materials, or the equipment and contents of structures or site disturbed in fulfilling any such guarantee.
- D. If the CONTRACTOR, after notice, fails to comply without the terms of the guarantee, the OWNER may have the defects corrected and the CONTRACTOR and CONTRACTOR's Surety shall be liable for all expenses incurred in connection therewith, including Engineer's fees.

1.08 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual Specification Sections.
- B. Deliver to project site and place in location as directed, obtain receipt prior to final payment.

PART 2 PRODUCTS                      Not Used

PART 3 EXECUTION                      Not Used

END OF SECTION

## **SECTION 23 09 23**

### **DIRECT DIGITAL CONTROL SYSTEM FOR HVAC**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Scope: Provide labor, material, equipment, related services, and supervision required, including, but not limited to, manufacturing, fabrication, configuration and installation for complete building automation system (also identified as BMS, Direct Digital Control System For HVAC) including all necessary hardware and all operating and applications software as required for the complete performance of the Work, as shown on the Drawings, as specified herein.
- B. Network level components of the system – workstations, servers, etc. shall communicate using the BACnet protocol, as defined by ASHRAE Standard 135-2004. No gateways shall be used for communication to controllers furnished under this section.
- C. At a minimum, provide controls for the following:
  - 1. Air Handling Units
  - 2. Boilers including hot water pumps
  - 3. Cabinet unit heater controls
  - 4. Chilled water system including pumps, chillers, and cooling towers
  - 5. Chillers
  - 6. Constant Air Volume Terminal Units
  - 7. Exhaust and Supply Fans
  - 8. Fan Coil Units
  - 9. Finned tube radiation control
  - 10. Hot Water Loop Pumps
  - 11. Monitoring points for packaged equipment such as emergency generators
  - 12. Return Air Fans
  - 13. Supply Fans
  - 14. Unit Heaters
  - 15. Unit Ventilators
  - 16. Variable volume and constant volume box control including interlocks with finned tube radiation
  - 17. Variable Frequency Drives
- D. Except as otherwise noted, the control system shall consist of all necessary Ethernet Network Controllers, Standalone Digital Control Units, Room Controllers, workstations, software, sensors, transducers, relays, valves, damper operators, control panels, and other accessory equipment, along with a complete system of electrical interlocking wiring to fill the intent of the specification and provide for a complete and operable system.

- E. The BAS system supplier shall review and study the existing system and all HVAC drawings and the entire specification to familiarize themselves with the equipment and system operation and to verify the quantities and types of operators, alarms, etc. to be provided.
- F. All interlocking wiring, wiring and installation of control devices associated with the equipment listed below shall be provided under this Contract. When the BAS system is fully installed and operational, the BAS system supplier and representatives of the Owner will review and check out the system – see System Acceptance and Testing section of this document. At that time, the BAS system supplier shall demonstrate the operation of the system and prove that it complies with the intent of the drawings and specifications.
- G. Provide services and manpower necessary for commissioning of the system in coordination with the Owner's representative.
- H. All work performed under this section of the specifications will comply with all governing codes, laws and governing bodies. If the drawings and/or specifications are in conflict with governing codes, the Contractor, with guidance from the Project Manager, shall submit a proposal with appropriate modifications to the project to meet code restrictions. If this specification and associated drawings exceed governing code requirements, the specification will govern.

## 1.2 REFERENCES

- A. General, Code Compliance: The code listed below form a part of this Specification to the extent referenced. The codes are referred to in the text by the basic designation only. The edition/revision of the referenced code shall be the latest date as of the date of the Contract Documents, unless otherwise specified.
  - 1. Provide BAS components and ancillary equipment, which are UL-916 listed and labeled.
  - 2. All equipment or piping used in conditioned air streams, spaces or return air plenums shall comply with NFPA 90A Flame/Smoke/Fuel contribution rating of 25/50/0 and all applicable building codes or requirements.
  - 3. All wiring shall conform to the National Electrical Code.
  - 4. All smoke dampers shall be rated in accordance with UL 555S.
  - 5. Comply with FCC rules, Part 15 regarding Class A radiation for computing devices and low power communication equipment operating in commercial environments.
  - 6. Comply with FCC, Part 68 rules for telephone modems and data sets.

## 1.3 DEFINITIONS

- A. Unless specifically defined within the Contract Documents, the words or acronyms contained within this specification shall be as defined within, or by the references listed within this specification, the Contract Documents, or, if not listed by either, by common industry practice.
  - 1. Standard
    - a. ASHRAE: American Society Heating, Refrigeration, Air Conditioning Engineers
    - b. AHU: Air Handling Unit
    - c. BACnet: Building Automation Controls Network
    - d. BMS: Building Management System
    - e. DDC: Direct Digital Control
    - f. EIA: Electronic Industries Alliance
    - g. GUI: Graphical User Interface
    - h. HVAC: Heating, Ventilation, and Air Conditioning
    - i. IEEE: Institute Electrical Electronic Engineers
    - j. MER: Mechanical Equipment Room

- k. PID: Proportional, Integral, Derivative
  - l. VAV: Variable Air Volume Box
- 2. Communications and protocols
  - a. ARP: Address Resolution Protocol
  - b. BACnet: Building Automation and Control Networks
  - c. CORBA: Common Object Request Broker Architecture
  - d. CSMA/CD: Carrier Sense Multiple Access/Collision Detect
  - e. DDE: Dynamic Data Exchange
  - f. FTP: File Transfer Protocol
  - g. FTT: Free Topology Transceivers
  - h. HTTP: Hyper Text Transfer Protocol
  - i. IIOP: Internet Inter-ORB Protocol
  - j. IP: Internet Protocol
  - k. LAN: Local Area Network
  - l. LON: Echelon Communication – Local Operating Network
  - m. MS/TP: Master Slave Token Passing
  - n. OBIX: Open Building Information Exchange
  - o. ODBC: Open Database Connectivity
  - p. ORB: Object Request Broker
  - q. SNVT: Standard Network Variables Types
  - r. SQL: Structured Query Language
  - s. UDP: User Datagram Protocol
  - t. XML: eXtensible Markup Language
- 3. Controllers
  - a. ASD: Application Specific Device
  - b. AAC: Advanced Application Controller
  - c. ASC: Application Specific Controller
  - d. CAC: Custom Application Controller
  - e. DCU: Distributed Control Unit
  - f. HRC: Hotel Room Controller
  - g. LCM: Local Control Module
  - h. MC: MicroControllers
  - i. MPC: Multi-purpose Controller
  - j. NSC: Network Server Controller
  - k. PEM: Package Equipment Module
  - l. PPC: Programmable Process Controller
  - m. RC: Room controller
  - n. RPC: Room Purpose Controller
  - o. SDCU: Standalone Digital Control Units
  - p. SLC: Supervisory Logic Controller
  - q. UEC: Unitary Equipment Controller
  - r. VAVDDC: Variable Air Volume Direct Digital Controller
- 4. Tools and Software
  - a. AFDD: Automated Fault Detection and Diagnostic

- b. APEO: Automated Predictive Energy Optimization
- c. DR: Demand Response
- d. CCDT: Configuration, Commissioning and Diagnostic Tool
- e. BPES: BACnet Portable Engineering Station
- f. LPES: LON Portable Engineering Station
- g. POT: Portable Operator's Terminal
- h. PEMS: Power and Energy Management Software
- i. MTBF: Mean Time Between Failure

#### 1.4 SYSTEM DESCRIPTION

- A. In accordance with the scope of work, the system shall also provide a graphical, web-based, operator interface that allows for instant access to any system through a standard browser. The contractor must provide PC-based programming workstations, operator workstations and microcomputer controllers of modular design providing distributed processing capability, and allowing future expansion of both input/output points and processing/control functions.
- B. For this project, the system shall consist of the following components:
  - 1. Administration and Programming Workstation(s): The BAS system supplier shall include Operation software and architecture as described in Part 2 of the specification. These workstations must be running the standard workstation software developed and tested by the manufacturer of the network server controllers and the standalone controllers. No third party front-end workstation software will be acceptable. Workstations must conform to the B-OWS BACnet device profile.
  - 2. Web-Based Operator Workstation: The BAS system supplier shall furnish licenses for web connection to the BAS system. Web-based users shall have access to all system points and graphics, shall be able to receive and acknowledge alarms, and shall be able to control setpoints and other parameters. All engineering work, such as trends, reports, graphics, etc. that are accomplished from the WorkStation shall be available for viewing through the web browser interface without additional changes. The web-based interface must conform to the B-OWS BACnet device profile. There will be no need for any additional computer based hardware to support the web-based user interface.
  - 3. Ethernet-based Network Router and/or Network Server Controller(s): The BAS system supplier shall furnish needed quantity of Ethernet-based Network Server Controllers as described in Part 2 of the specification. These controllers will connect directly to the Operator Workstation over Ethernet at a minimum of 100mbps, and provide communication to the Standalone Digital Control Units and/or other Input/Output Modules. Network Server Controllers shall conform to BACnet device profile B-BC. Network controllers that utilize RS232 serial communications or ARCNET to communicate with the workstations will not be accepted. Network Controllers shall be tested and certified by the BACnet Testing Laboratory (BTL) as BACnet Building Controllers (B-BC).
  - 4. Standalone Digital Control Units (SDCUs): Provide the necessary quantity and types of SDCUs to meet the requirements of the project for mechanical equipment control including air handlers, central plant control, and terminal unit control. Each SDCU will operate completely standalone, containing all of the I/O and programs to control its associated equipment. Each BACnet protocol SDCU shall conform to the BACnet device profile B-AAC. BACnet SDCUs shall be tested and certified by the BACnet Testing Laboratory (BTL) as BACnet Advanced Application Controllers (B-AAC).
- C. The Local Area Network (LAN) shall be either a 10 or 100 Mbps Ethernet network supporting BACnet, Modbus, XML and HTTPS for maximum flexibility for integration of building data with enterprise information systems and providing support for multiple Network Server Controllers (NSCs), user workstations and a local host computer system.

- D. The Enterprise Ethernet (IEEE 802.3) LAN shall utilize Carrier Sense Multiple/Access/Collision Detect (CSMA/CD), Address Resolution Protocol (ARP) and User Datagram Protocol (UDP) operating at 10 or 100 Mbps.
- E. The system shall enable an open architecture that utilizes EIA standard 709.1, the LonTalk™ protocol and/or ANSI / ASHRAE™ Standard 135-2004, BACnet functionality to assure interoperability between all system components. Native support for the LonTalk™ protocol and the ANSI / ASHRAE™ Standard 135-2004, BACnet protocol are required to assure that the project is fully supported by the HVAC open protocols to reduce future building maintenance, upgrade, and expansion costs.
- F. The system shall enable an architecture that utilizes a MS/TP selectable 9.6-76.8 Kbaud protocol, as a common communication protocol between controllers and integral ANSI / ASHRAE™ Standard 135-2004, BACnet functionality to assure interoperability between all system components. The AAC shall be capable of communicating as a MS/TP device or as a BACnet IP device communicating at 10/100 Mbps on a TCP/IP trunk. The ANSI / ASHRAE™ Standard 135-2004, BACnet protocol is required to assure that the project is fully supported by the leading HVAC open protocol to reduce future building maintenance, upgrade, and expansion costs.
- G. LonTalk™ packets may be encapsulated into TCP/IP messages to take advantage of existing infrastructure or to increase network bandwidth where necessary or desired.
  - 1. Any such encapsulation of the LonTalk™ protocol into IP datagrams shall conform to existing LonMark™ guide functionality lines for such encapsulation and shall be based on industry standard protocols.
  - 2. The products used in constructing the BMS shall be LonMark™ compliant.
  - 3. In those instances, in which LonMark™ devices are not available, the BMS system supplier shall provide device resource files and external interface definitions for LonMark devices.
- H. The software tools required for network management of the LonTalk™ protocol and the ANSI / ASHRAE™ Standard 135-2004, BACnet protocol must be provided with the system. Drawings are diagrammatic only. Equipment and labor not specifically referred to herein or on the plans and are required to meet the functional intent, shall be provided without additional cost to the Owner. BACnet clients shall comply with the BACnet Operator Workstation (B-OWS) device profile; with the ability to support data read and write functionality. Physical connection of BACnet devices shall be via Ethernet IP or MS/TP. Physical connection of LonWorks devices shall be via Ethernet IP or FTT-10A.
- I. The system shall provide support for Modbus TCP and RTU protocols natively, and not require the use of gateways.
- J. Complete temperature control system to be DDC with electronic sensors and electronic/electric actuation of Mechanical Equipment Room (MER) valves and dampers and electronic actuation of terminal equipment valves and actuators as specified herein. The BMS is intended to seamlessly connect devices throughout the building regardless of subsystem type, i.e. variable frequency drives, low voltage lighting systems, electrical circuit breakers, power metering and card access should easily coexist on the same network channel.
  - 1. The supplied system must incorporate the ability to access all data using HTML5 enabled browsers without requiring proprietary operator interface and configuration programs. The system shall not require JAVA to be enabled in the browser.
  - 2. Data shall reside on a supplier-installed server for all database access.
  - 3. A hierarchical topology is required to assure reasonable system response times and to manage the flow and sharing of data without unduly burdening the customer's internal Intranet network.
- K. All work described in this section shall be installed, wired, circuit tested and calibrated by factory certified technicians qualified for this work and in the regular employment of the approved manufacturer's local field office. The approved manufacturer's local field office shall have a minimum of 3 years of installation



experience with the manufacturer and shall provide documentation in the bid and submittal package verifying longevity of the installing company's relationship with the manufacturer when requested. Supervision, hardware and software engineering, calibration and checkout of the system shall be by the employees of the approved manufacturer's local field office and shall not be subcontracted. The control contractor shall have an in place support facility within 100 miles of the site with factory certified technicians and engineers, spare parts inventory and all necessary test and diagnostic equipment for the installed system, and the control contractor shall have 24 hours/day, 7 days/week emergency service available.

- L. Provide the Commissioning, configuration and diagnostic tool (CCDT), color display personnel computer, software, and interfaces to provide uploading/downloading of High Point Count Controllers (AAC), Unitary Equipment Controllers (UEC) and VAV controllers (VAVDDC), monitoring all BACnet objects, monitoring overrides of all controller physical input/output points, and editing of controller resident time schedules.

## 1.5 SUBMITTALS

- A. General: Submittals shall be in accordance with requirements specified herein.
  - 1. All shop drawings shall be prepared in Visio Professional or AutoCAD software. In addition to the drawings, the Contractor shall furnish a CD containing the identical information. Drawings shall be B size or larger.
  - 2. Shop drawings shall include a riser diagram depicting locations of all controllers and workstations, with associated network wiring. Also included shall be individual schematics of each mechanical system showing all connected points with reference to their associated controller. Typical's will be allowed where appropriate.
  - 3. Submittal data shall contain manufacturer's data on all hardware and software products required by the specification. Valve, damper and air flow station schedules shall indicate size, configuration, capacity and location of all equipment.
  - 4. Software submittals shall contain narrative descriptions of sequences of operation, program listings, point lists, and a complete description of the graphics, reports, alarms and configuration to be furnished with the workstation software. Information shall be bound or in a three ring binder with an index and tabs. Diagrams shall be on 11" by 17" foldouts. If color has been used to differentiate information, the printed copies shall be in color.
  - 5. Submit five (5) copies of submittal data and shop drawings to the Project Manager for review prior to ordering or fabrication of the equipment. The Contractor, prior to submitting, shall check all documents for accuracy.
  - 6. The Project Manager will make corrections, if required, and return to the Contractor. The Contractor will then resubmit with the corrected or additional data. This procedure shall be repeated until all corrections are made to the satisfaction of the Project Manager and the submittals are fully approved.
  - 7. The following is a list of post construction submittals that shall be updated to reflect any changes during construction and re-submitted as "As-Built".
    - a. System architecture drawing.
    - b. Layout drawing for each control panel
    - c. Wiring diagram for individual components
    - d. System flow diagram for each controlled system
    - e. Instrumentation list for each controlled system
    - f. Sequence of control
    - g. Binding map
    - h. A matrix sheet detailing all system addresses and communication settings for the following:
      - 1) All IP network addresses & settings

- 2) All BMS device addresses & communication settings
  - i. Operation and Maintenance Manuals
- 8. Information common to the entire system shall be provided. This shall include but not be limited to the following.
  - a. Product manuals for the key software tasks.
  - b. Operating the system.
  - c. Administrating the system.
  - d. Engineering the operator workstation.
  - e. Application programming.
  - f. Engineering the network.
  - g. Setting up the web server.
  - h. Report creation.
  - i. Graphics creation.
  - j. All other engineering tasks.
  - k. System Architecture Diagram.
  - l. List of recommended maintenance tasks associated with the system servers, operator workstations, data servers, web servers and web clients.
  - m. Define the task.
  - n. Recommend a frequency for the task.
  - o. Reference the product manual that includes instructions on executing the task.
  - p. Names, addresses, and telephone numbers of installing contractors and service representatives for equipment and control systems.
  - q. Licenses, guarantees, and warranty documents for equipment and systems.
  - r. Submit one copy for each building, plus two extra copies.
- 9. Information common to the systems in a single building shall be provided.
  - a. System architecture diagram for components within the building annotated with specific location information.
  - b. As-built drawing for each control panel.
  - c. As-built wiring design diagram for all components.
  - d. Installation design details for each I/O device.
  - e. As-built system flow diagram for each system.
  - f. Sequence of control for each system.
  - g. Binding map for the building.
  - h. Product data sheet for each component.
  - i. Installation data sheet for each component.
  - j. Submit two copies for each building and two extra copies.
- 10. Software shall be provided:
  - a. Submit a copy of all software installed on the servers and workstations.
  - b. Submit all licensing information for all software installed on the servers and workstations.
  - c. Submit a copy of all software used to execute the project even if the software was not installed on the servers and workstations.
  - d. Submit all licensing information for all of the software used to execute the project.
  - e. All software revisions shall be as installed at the time of the system acceptance.
  - f. Firmware Files

- g. Submit a copy of all firmware files that were downloaded to or pre-installed on any devices installed as part of this project.
- h. This does not apply to firmware that is permanently burned on a chip at the factory and can only be replaced by replacing the chip.
- i. Submit a copy of all application files that were created during the execution of the project.
- j. Submit a copy of all graphic page files created during the execution of the project.

## 1.6 QUALITY ASSURANCE

- A. All bidders must be building automation contractors in the business of installing direct digital control building automation systems for a minimum of 5 years.
  - 1. The Building Management System contractor shall have a full service facility within 50 miles of the project that is staffed with engineers trained and certified by the manufacturer in the configuration, programming and service of the automation system. The contractor's technicians shall be fully capable of providing instructions and routine emergency maintenance service, for a 24 hour, special needs facility, on all system components.
  - 2. Any installing contractor, not listed as prequalified in the Approved Manufacturer's section, shall submit credentials as detailed in the Pre-bid Submittal section for the engineer's review 2 weeks prior to bid date. Failure to follow the attached formats shall disqualify potential alternate bidders. Credentials must attest that the contractor meets all requirements of the specification and the Project Manager's judgment regarding approval to bid as an acceptable installer after reviewing the data will be final.
- B. All bidders must be authorized distributors or branch offices of the manufacturers specified.
- C. The following bidders have been pre-qualified:
  - 1. Schneider Electric
  - 2. Or as approved by Project Manager.
- D. Any installing contractors or manufacturers interested in participating as acceptable bidders for this project that are not pre-qualified shall furnish a detailed technical pre-bid submittal to the Project Manager. All information must be submitted 2 weeks prior to the published bid date to allow the Project Manager adequate time to review the bidder's credentials.
- E. The Pre-Bid submittal shall contain the following information as a minimum:
  - 1. A profile of the manufacturer and the local installation and service/organization.
  - 2. Description of how the system meets and achieves all the specified criteria in terms of configuration, operation, and control.
  - 3. System Architecture with single line riser diagram showing all major components (digital controllers, routers, hubs, etc.) that will be required for this project.
  - 4. Procedure for commissioning and time required to startup and commission each of the systems for this project.
  - 5. Contractors approach for the project planning and management.
  - 6. Product Data Sheets for all components, DDC panels, and all accessories listed per the appropriate specification sections herein.
  - 7. Examples of actual graphic screens for other similar projects.
  - 8. Number and types of DDC panels required for this installation.
  - 9. Number and types of spare points provided with the proposed system.
  - 10. Recommended spare parts list for components with list price schedule.

11. List of 2 similar systems in size, point capacity, total installed value, installed and commissioned by the local office with a list of the installers/manufacturers design team members for each project and the owners contact information.
  12. Samples of service offerings and a list of current similar service contracts with contact information.
  13. Resumes for the management team and all employees who will be involved with the project design, commissioning, project management, and after installation service. Resumes should include copies of manufacturer's certifications for the proposed product line.
  14. Copy of this Control Specification in its entirety with a check mark beside each paragraph to signify that the manufacturer's equipment and software shall fully conform to the specified requirement. If the requirement cannot be met, indicate the reasons/limitations and the alternative proposed.
  15. An interview may be conducted and the bidder will be requested to make a formal presentation concerning the proposed system and possibly provide an installed project tour prior to a final decision.
- F. Each point in the system shall be tested for both hardware and software functionality. In addition, each mechanical and electrical system under control of the BAS will be tested against the appropriate sequence of operation specified herein. Successful completion of the system test shall constitute the beginning of the warranty period. A written report will be submitted to the owner indicating that the installed system functions in accordance with the plans and specifications.
- G. The BAS system supplier shall commission and set in operating condition all major equipment and systems, such as the chilled water, hot water and all air handling systems, in the presence of the equipment manufacturer's representatives, as applicable, and the Owner and Architect's representatives. If the vendor is providing an AFDD/CC system, use of the analytics shall be used to help commission the system.
- H. The BAS system supplier shall provide a technician for 5 days manpower and engineering services required to assist the HVAC Contractor and Balancing Contractor in testing, adjusting, and balancing all systems in the building. The BAS system supplier shall coordinate all requirements to provide a complete air balance with the Balancing Contractor and shall include all labor and materials in his contract.
- I. Startup Testing shall be performed for each task on the startup test checklist, which shall be initialed by the technician and dated upon test was completion along with any recorded data such as voltages, offsets or tuning parameters. Any deviations from the submitted installation plan shall also be recorded.
- J. Required elements of the startup testing include:
1. Measurement of voltage sources, primary and secondary
  2. Verification of proper controller power wiring.
  3. Verification of component inventory when compared to the submittals.
  4. Verification of labeling on components and wiring.
  5. Verification of connection integrity and quality (loose strands and tight connections).
  6. Verification of bus topology, grounding of shields and installation of termination devices.
  7. Verification of point checkout.
  8. Each I/O device is landed per the submittals and functions per the sequence of control.
  9. Analog sensors are properly scaled and a value is reported
  10. Binary sensors have the correct normal position and the state is correctly reported.
  11. Analog outputs have the correct normal position and move full stroke when so commanded.
  12. Binary outputs have the correct normal state and respond appropriately to energize/de-energize commands.
  13. Documentation of analog sensor calibration (measured value, reported value and calculated offset).

14. Documentation of Loop tuning (sample rate, gain and integral time constant).

- K. A performance verification test shall also be completed for the operator interaction with the system. Test elements shall be written to require the verification of all operator interaction tasks including, but not limited to the following.
1. Graphics navigation.
  2. Trend data collection and presentation.
  3. Alarm handling, acknowledgement and routing.
  4. Time schedule editing.
  5. Application parameter adjustment.
  6. Manual control.
  7. Report execution.
  8. Automatic backups.
  9. Web Client access.
- L. A Startup Testing Report and a Performance Verification Testing Report shall be provided upon test completion.

## **1.7 COORDINATION**

- A. Coordinate location of thermostats, humidistats, and other exposed control sensors with plans and room details before installation.
- B. Coordinate equipment from other divisions including "Intrusion Detection," "Lighting Controls," "Motor Control Centers," "Panel boards," and "Fire Alarm" to achieve compatibility with equipment that interfaces with those systems.
- C. Coordinate supply of conditioned electrical circuits for control units and operator workstation.
- D. Coordinate location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete".
- E. Coordinate with the Owner's IT department on locations for NSC's, Ethernet communication cabling and TCP/IP addresses.

## **1.8 OWNERSHIP**

- A. The Owner shall retain licenses to software for this project.
- B. The Owner shall sign a copy of the manufacturer's standard software and firmware licensing agreement as a condition off this contractor. Such license shall grant use of all programs and application software to the Owner as defined by the manufacturer's license agreement, but shall protect the manufacturer's rights to disclosure of Trade Secrets contained within such software.
- C. The licensing agreement shall not preclude the use of the software by individuals under contract to the owner for commissioning, servicing or altering the system in the future. Use of the software by individuals under contract to the owner shall be restricted to use on the owner's computers and only for the purpose of commissioning, servicing, or altering the installed system.
- D. All project developed software, files and documentation shall become the property of the Owner. These include but are not limited to:
1. Server and workstation software

2. Application programming tools
3. Configuration tools
4. Network diagnostic tools
5. Addressing tools
6. Application files
7. Configuration files
8. Graphic files
9. Report files
10. Graphic symbol libraries
11. All documentation

## **1.9 WORK BY OTHERS**

- A. The BAS system supplier shall cooperate with other contractors performing work on this project necessary to achieve a complete and neat installation. To that end, each contractor shall consult the drawings and specifications for all trades to determine the nature and extent of others' work.
- B. The BAS system supplier shall furnish all Control Valves, Flow Meters, Flow Switches, Sensor Wells for installation by others.
- C. The BAS system supplier shall provide field supervision for the installation of the following:
  1. Automatic control dampers
  2. Blank-off plates for dampers that are smaller than duct size.
  3. Sheet metal baffles plates to eliminate stratification.
  4. The Electrical Contractor shall provide:
    - a. All 120VAC power wiring to motors, heat trace, junction boxes for power to BAS panels.
    - b. Furnish smoke detectors and wire to the building fire alarm system. HVAC Contractor to mount devices. BAS system supplier to hardwire to fan shut down.
    - c. Auxiliary contact (pulse initiator) on the electric meter for central monitoring of kWh and KW. Electrical Contractor shall provide the pulse rate for remote readout to the BAS. BAS system supplier to coordinate this with the electrical contractor.
- D. Prior to delivery to the Project site, ensure that suitable storage space is available to store materials in a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, humidity, and corrosive atmospheres. Materials shall be protected during delivery and storage and shall not exceed the manufacturer stated storage requirements. As a minimum, store indoors in clean, dry space with uniform temperature to prevent condensation. In addition, protect electronics from all forms of electrical and magnetic energy that could reasonably cause damage.
- E. Deliver materials to the Project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and equipment tag number or service name as identified within the Contract Documents.
- F. Inspect and report any concealed damage or violation of delivery storage, and handling requirements to the Engineer.

## **1.10 WARRANTY**

- A. All components, system software, and parts furnished and installed by the BMS system supplier shall be guaranteed against defects in materials and workmanship for 1 year of substantial completion. Labor to repair, reprogram, or replace these components shall be furnished by the BMS system supplier at no

charge during normal working hours during the warranty period. Materials furnished but not installed by the BMS system supplier shall be covered to the extent of the product only. Installation labor shall be the responsibility of the trade contractor performing the installation. All corrective software modifications made during warranty periods shall be updated on all user documentation and on user and manufacturer archived software disks. The Contractor shall respond to the owner's request for warranty service within 24 standard working hours.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis of Design Product: Subject to compliance with requirements, provide products by one of the following pre-qualified manufacturers:
1. Electric Components
    - a. Schneider-Electric Field Devices
  2. Electronic Components
    - a. Schneider-Electric Field Devices
  3. Direct Digital Control Systems Field Controller Devices:
    - a. Schneider Electric EcoStruxure Building MP/RP BACnet series, b3 BACnet series, MNB BACnet installed by approved manufacturer's local field office or authorized distributor.
    - b. Or approved equal.

### 2.2 OPEN, INTEROPERABLE SYSTEM ARCHITECTURE

- A. A. General
1. The Building Automation System (BAS) shall consist of Network Server/Controllers (NSCs), a family of Standalone Digital Control Units (SDCUs), Administration and Programming Workstations (APWs), and Web-based Operator Workstations (WOWs). The BAS shall provide control, alarm detection, scheduling, reporting and information management for the entire facility, and Wide Area Network (WAN) if applicable.
  2. An Enterprise Level BAS shall consist of an Enterprise Server, which enables multiple NSCs (including all graphics, alarms, schedules, trends, programming, and configuration) to be accessible from a single Workstation simultaneously for operations and engineering tasks.
  3. The Enterprise Level BAS shall support built-in reporting functionality without dependency on other software.
  4. The Enterprise Level BAS shall support standard accessing of data for third party reporting or analytics software.
  5. The Enterprise Level BAS shall be able to host up to 250 servers, or NSCs, beneath it.
  6. For Enterprise reporting capability and robust reporting capability outside of the trend chart and listing ability of the Workstation, a Reports Server shall be installed on a Microsoft Windows SQL based computer. The Reports Server can be installed on the same computer as the Enterprise Server.
  7. The system shall be designed with a top-level 10/100bT Ethernet network, using the BACnet/IP, LonWorks IP, and/or Modbus TCP protocol.
- B. Modbus RTU/ASCII (and J-bus), Modbus TCP, BACnet MS/TP, BACnet IP, LonTalk FTT-10A, and WebServices shall be native to the NSCs. There shall not be a need to provide multiple NSCs to support all the network protocols, nor should there be a need to supply additional software to allow all three protocols to be natively supported.

- C. A sub-network of SDCUs using the BACnet IP, BACnet MS/TP protocol shall connect the local, stand-alone controllers with Ethernet-level Network Server Controllers/IP Routers.
- D. The TCP/IP layer connects all of the buildings on a single Wide Area Network (WAN) isolated behind the campus firewall. Fixed IP addresses for connections to the campus WAN shall be used for each device that connects to the WAN.
- E. The fieldbus layer shall support all of the following types of SDCUs:
  - 1. BACnet IP SDCU requirements: The system shall consist of one or more BACnet/IP field buses managed by the Network Server Controller. The field bus layer shall consist of up to 50 IP SDCUs in daisy chain topology, or 39 if using RSTP, per layer, with a max of 5 sub networks in daisy chain for a total of 250 SDCUs or 6 sub networks in RSTP for a total of 234 SDCUs.
  - 2. BACnet MS/TP SDCU requirements: The system shall consist of one or more BACnet MS/TP field buses managed by the Network Server Controller. Minimum speed shall be 76.8kbps. The field bus layer consists of an RS485, token passing bus that supports up to 127 Standalone Digital Control Units (SDCUs) for operation of HVAC and lighting equipment. These devices shall conform to BACnet standard 135-2004. The NSCs shall be capable of at least two BACnet MS/TP field buses for a total capability of 254 SDCUs per NSC.
- F. The BAS shall be capable of being segmented, through software, into multiple local area networks (LANs) distributed over a wide area network (WAN). Workstations can manage a single LAN (or building), and/or the entire system with all portions of that LAN maintaining its own, current database.
- G. All NSCs, Workstation(s) and Servers shall be capable of residing directly on the owner's Ethernet TCP/IP LAN/WAN with no required gateways. Furthermore, the NSC's, Workstation(s), and Server(s) shall be capable of using standard, commercially available, off-the-shelf Ethernet infrastructure components such as routers, switches and hubs. With this design the owner may utilize the investment of an existing or new enterprise network or structured cabling system. This also allows the option of the maintenance of the LAN/WAN to be performed by the owner's Information Systems Department as all devices utilize standard TCP/IP components.
- H. System Expansion
  - 1. The BAS system shall be scalable and expandable at all levels of the system using the same software interface, and the same TCP/IP level and fieldbus level controllers. Systems that require replacement of either the workstation software or field controllers in order to expand the system shall not be acceptable.
  - 2. Web-based operation shall be supported directly by the NSCs and require no additional software.
  - 3. The system shall be capable of using graphical and/or line application programming language for the Network Server Controllers.
  - 4. The system shall be able to operate normally and without restriction at multiple software version levels with the only requirement that each element of the hierarchy be at least as new a version as the newest version in the level below it. In other words, Enterprise Servers will be able to manage NSCs of different version provided that the Enterprise Server was the same or more recent version than the most recent NSC version.
- I. All Network Server Controllers must natively support the BACnet IP, BACnet MS/TP, LonWorks FTT-10, Modbus TCP, Modbus RTU (RS-485 and RS-232), and Modbus ASCII protocols.

## **2.3 OPERATOR WORKSTATION REQUIREMENTS**

- A. General
  - 1. The operator workstation portion of the BAS shall consist of two full-powered configuration and programming workstations, and one web-based operator workstation. For this project provide a minimum of 3 concurrent client licenses at the enterprise level. Client licenses are licenses that can



be used for variable designations of the users choosing; i.e. operator, engineering, or web capabilities.

2. The programming and configuration workstation software shall allow any user with adequate permission to create and/or modify any or all parts of the NSC and/or Enterprise Server database.
3. At the NSC level, there shall be no cap on concurrent web-based workstations (webstations) other than what the CPU capacity can support.
4. All configuration workstations shall be personal computers operating under the Microsoft Windows operating system. The application software shall be capable of communication to all Network Server Controllers and shall feature high-resolution color graphics, alarming, trend charting. It shall be user configurable for all data collection and data presentation functions.
5. A minimum of 1 physical Workstation shall be allowed on the Ethernet network. In this client/server configuration, any changes or additions made from one workstation will automatically appear on all other workstations since the changes are accomplished to the databases within the NSC. Systems with a central database will not be acceptable.

B. Enterprise Central, Enterprise Server, Administration/Programming Workstation, and Webstation Requirements

1. The Enterprise Central shall consist of the following:
  - a. Processor
    - 1) Minimum: Intel Core i5 @ 3.0 GHz or equivalent
    - 2) Recommended: Intel Core i5 @ 4.0 GHz or better
  - b. Memory
    - 1) Minimum: 6GB
    - 2) Recommended: 12GB or higher
  - c. Operating systems:
    - 1) Microsoft Windows 10 64-bit
    - 2) Microsoft Windows Server 2012 R2 64-bit
    - 3) Microsoft Windows Server 2016
    - 4) Microsoft Windows Server 2019
  - d. 10/100MBPS Ethernet NIC
  - e. Storage
    - 1) Minimum: 1TB
    - 2) Recommended: 4TB
    - 3) Solid State Drive recommended
  - f. Required additional software:
    - 1) Microsoft .Net 4.7.2 and later
  - g. License agreement for all applicable software
  - h. External log storage option
    - 1) PostgreSQL 11.0 and later
    - 2) TimescaleDB 1.2 and later
2. The Enterprise Server shall consist of the following:
  - a. Processor
    - 1) Minimum: Intel Core i5 @ 2.0 GHz or equivalent
    - 2) Recommended: Intel Core i5 @ 3.0 GHz or better
  - b. Memory
    - 1) Minimum: 4GB
    - 2) Recommended: 8GB or higher
  - c. Operating systems:
    - 1) Microsoft Windows 7 64-bit
    - 2) Microsoft Windows 10 64-bit

- 3) Microsoft Windows Server 2012 R2 64-bit
    - 4) Microsoft Windows Server 2016
    - 5) Microsoft Windows Server 2019
  - d. 10/100MBPS Ethernet NIC
  - e. Storage
    - 1) Minimum: 100GB
    - 2) Recommended: 1TB
    - 3) Solid State Drive recommended
  - f. Required additional software:
    - 1) Microsoft .Net 4.7.2 and later
  - g. License agreement for all applicable software
  - h. External log storage option
    - 1) PostgreSQL 11.0 and later
    - 2) TimescaleDB 1.2 and later
- 3. The Workstation shall consist of the following:
  - a. Processor
    - 1) Minimum: Intel Core i5 @ 2.0 GHz or equivalent
    - 2) Recommended: Intel Core i5 @ 3.0 GHz or better
  - b. Memory
    - 1) Minimum: 4GB
    - 2) Recommended: 8GB or higher
  - c. Operating systems:
    - 1) Microsoft Windows 7 64-bit
    - 2) Microsoft Windows 10 64-bit
    - 3) Microsoft Windows Server 2012 R2 64-bit
    - 4) Microsoft Windows Server 2016
    - 5) Microsoft Windows Server 2019
  - d. 10/100MBPS Ethernet NIC
  - e. Storage
    - 1) Minimum: 20GB
    - 2) Recommended: 1TB
    - 3) Solid State Drive recommended
  - f. Required additional software:
    - 1) Microsoft .Net 4.7.2 and later
  - g. License agreement for all applicable software
- 4. Web-Based Operator PC Requirements
  - a. Any user on the network can access the system, using the following software:
  - b. Minimum:
    - 1) Google Chrome 61 or higher
    - 2) Mozilla Firefox 60 or higher
    - 3) Microsoft Edge (EdgeHTML) 16 or higher
    - 4) Safari 11.1 or higher
  - c. Recommended:
    - 1) Google Chrome 71 or higher
    - 2) Mozilla Firefox 64 or higher
    - 3) Microsoft Edge (EdgeHTML) 17 or higher

4) Safari 11.4 or higher

C. General Administration and Programming Workstation Software

1. System architecture shall be truly client server in that the Workstation shall operate as the client while the NSCs shall operate as the servers. The client is responsible for the data presentation and validation of inputs while the server is responsible for data gathering and delivery.
2. The workstation functions shall include monitoring and programming of all DDC controllers. Monitoring consists of alarming, reporting, graphic displays, long term data storage, automatic data collection, and operator-initiated control actions such as schedule and setpoint adjustments.
3. Programming of SDCUs shall be capable of being done either off-line or on-line from any operator workstation. All information will be available in graphic or text displays stored at the NSC. Graphic displays will feature animation effects to enhance the presentation of the data, to alert operators of problems, and to facilitate location of information throughout the DDC system. All operator functions shall be selectable through a mouse.

D. User Interface:

1. The BAS workstation software shall allow the creation of a custom, browser-style interface linked to the user when logging into any workstation. Additionally, it shall be possible to create customized workspaces that can be assigned to user groups. This interface shall support the creation of "hot-spots" that the user may link to view/edit any object in the system or run any object editor or configuration tool contained in the software. Furthermore, this interface must be able to be configured to become a user's "PC Desktop" – with all the links that a user needs to run other applications. This, along with the Windows user security capabilities, will enable a system administrator to setup workstation accounts that not only limit the capabilities of the user within the BAS software, but may also limit what a user can do on the PC and/or LAN/WAN. This might be used to ensure, for example, that the user of an alarm monitoring workstation is unable to shutdown the active alarm viewer and/or unable to load software onto the PC.
2. System shall be able to automatically switch between displayed metric vs. imperial units based on the workstation/webstations localization.
3. The BMS workstation/webstations shall be capable of multiple language display, including English, Spanish, German, French, Japanese, Italian, Finnish, Portuguese, Swedish, Russian, and traditional and simplified Chinese. The multiple languages shall not require additional add on software from the standard workstation installer and shall be selectable within said workstation.
4. Webstations shall have the capability to automatically re-direct to an HTTPS connection to ensure more secure communications.
5. Personalized layouts and panels within workstations shall be extended to webstations to ensure consistent user experiences between the two user interfaces.
6. Webstations shall give the user the same capabilities within the graphics pages as are given within the workstation but shall be mobile responsive for use on smaller devices.
7. Servers and clients shall have the ability to be located in different time zones, which are then synchronized via the NTP server.
8. Workstation shall indicate at all times the communication status between it and the server.
9. The BMS web interface shall enable presentation mode whereby any functionality for interactivity shall be disabled.
10. The BMS web interface shall automatically detect light mode and dark mode settings in the operating system and adapt accordingly.
11. The BMS web interface shall allow override of the operating systems light/dark mode settings so that the setting can be enabled independent of the operating system's setting.
12. The BMS web interface shall automatically respond and adapt to different screen sizes and orientations from smart phone to smart televisions of any size.
13. The BMS web interface shall support slideshow functionality.

14. The BMS web interface shall support full screen mode displaying Alarm views / graphics / dashboards / Custom Reports.

E. User Access and Permissions

1. The BMS system shall allow for creation of one account per user.
2. The BMS shall support Groups where User Accounts associated with the group can inherit group permissions.
3. The BMS shall be able to specify each user account / group accessibility to each object in the system.
4. The BMS permission system shall be possible to integrate with Windows Active directory.
5. The BMS shall be able to report on the permission level across account / group for review / archiving / audit.
6. This username/password combination shall be linked to a set of capabilities within the software, set and editable only by user with system administrator privileges. The sets of capabilities shall include: edit or View only, Acknowledge alarms, Enable/disable Program and change values.
7. The system shall allow the above capabilities to be applied independently to each and every class of object in the system.
8. The BMS shall support integration with Windows Active Directory for user log on credentials.
9. The BMS shall support configurable reminder for "Days until password expires".
10. The BMS shall support configurable password policy across:
  - a. Minimum number of characters
  - b. Minimum number of lowercase characters
  - c. Minimum number of numeric characters
  - d. Minimum number of special characters
  - e. Number of consecutive unique passwords before reuse
  - f. No more than three repeating identical characters
11. The BMS user account management shall support password policy with the following components:
  - a. Mandatory change of password at first logon with default credentials
  - b. Disabling of all imported user accounts by default
  - c. Custom password complexity rules and its enforcement
  - d. Custom password reuse and its enforcement
  - e. Configurable black listing of passwords to limit the use of common known passwords (e.g. password)
  - f. Password aging rules
12. The BMS shall be capable of enabling an anonymous access (guest account) to previously engineered views such as dashboards, graphics, etc. with configurable permissions and without username or password.
13. It shall be possible to configure the BMS system so that the guest account is used by default to simplify presentation of Kiosk Mode across multiple screens
14. The BMS shall provide time configurability to logout the user and to revert to a preconfigured presentation view, such as offered by the Guest account functionality.
15. The BMS shall provide configurability in managing access and permission levels based on location, IP addresses and address ranges, Schedule and Time of day and combination thereof.

F. System Security

1. The BMS system supplier The BMS vendor shall be certified to Security Development Lifecycle process that is certified to IEC 62443-4-1 by a reputable third party independent lab.
2. The BMS system supplier shall be subjected to regular and verifiable best practice cyber security testing by the system supplier. Results of this testing shall be made available upon request prior to deployment of the system.
3. The BMS system supplier shall provide cyber security service incident escalation through help desk on a 7/24/365 basis.
4. The BMS shall support configuration for inactivity auto log-off of logged clients
5. The BMS system shall support Self-Signed Certificates, Default Certificates and/or Certification Authority (CA) certificates.
6. The BMS client communications (web access or rich client access) shall support TLS 1.2 encryption or higher
7. The BMS shall allow configuration in disabling all devices and software that support HTTP and require access via HTTPS.
8. The BMS must be able to Alarm or generate notification on failed access attempts
9. The BMS Servers shall support SNMP V3 monitoring of network performance and stack statistics for the purpose of managing denial of service attacks
10. The Integrated Control Platform shall support the feature to alarm on a predetermined period of time until the default password for each device is changed from the default factory setting.
11. The Integrated Control Platform shall support encrypted password authentication for all web services whether serving or consuming.
12. The BMS shall have the capability to use blacklisted and whitelisted IPs/MAC addresses to gate access
13. The BMS shall have the capability to differentiate, limit or enable, user access depending on Client's IP address/range (where) and time of day (when) the user is accessing the system.

G. Configuration Interface

1. The workstation software shall use a familiar Windows Explorer style interface for an operator or programmer to view and/or edit any object (controller, point, alarm, report, schedule, etc.) in the entire system. In addition, this interface shall present a "network map" of all controllers and their associated points, programs, graphics, alarms, and reports in an easy to understand structure. All object names shall be alphanumeric and use Windows long filename conventions.
2. The configuration interface shall also include support for user defined object types. These object types shall be used as building blocks for the creation of the BAS database. They shall be created from the base object types within the system input, output, string variables, setpoints, etc., alarm algorithms, alarm notification objects, reports, graphics displays, schedules, and programs. Groups of user defined object types shall be able to be set up as a predefined aggregate of subsystems and systems. The configuration interface shall support copying/pasting and exporting/importing portions of the database for additional efficiency. The system shall also maintain a link to all "child" objects created. If a user wishes to make a change to a parent object, the software shall ask the user if he/she wants to update all of the child objects with the change.

H. Color Graphic Displays

1. The system shall allow for the creation of user defined, color graphic displays for the viewing of mechanical and electrical systems, or building schematics. These graphics shall contain point information from the database including any attributes associated with the point (engineering units,

- etc.). In addition, operators shall be able to command equipment or change setpoints from a graphic through the use of the mouse.
2. Requirements of the color graphic subsystem include:
    - a. At a minimum, the user shall have the ability to import .gif, .png, .bmp, .jpeg, .tif, and CAD generated picture files as background displays, and layering shall be possible.
    - b. The system shall support HTML5 enabled graphics.
    - c. It shall be possible for the user to use JavaScript to customize the behavior of each graphic.
    - d. The editor shall use Scalable Vector Graphics (SVG) technology.
    - e. A built-in library of animated objects such as dampers, fans, pumps, buttons, knobs, gauges, and graphs which can be “dropped” on a graphic through the use of a software configuration “wizard”. These objects shall enable operators to interact with the graphic displays in a manner that mimics their mechanical equivalents found on field installed control panels.
    - f. Support for high DPI icons shall be included and automatically chosen if viewing on a high definition display such as Retina or 4K displays.
    - g. Using the mouse, operators shall be able to adjust setpoints, start or stop equipment, modify PID loop parameters, or change schedules.
    - h. Status changes or alarm conditions must be able to be highlighted by objects changing screen location, size, color, text, blinking or changing from one display to another.
    - i. Ability to link graphic displays through user defined objects, alarm testing, or the result of a mathematical expression. Operators must be able to change from one graphic to another by selecting an object with a mouse - no menus will be required.
    - j. It shall be possible to create and save graphical components and JavaScript code in reusable and transferrable, customized libraries.
    - k. Graphics should rescale based on whatever monitor or viewing device is being used.
    - l. Be able to create graphics on varying layers that can be moved and repeated.
    - m. Be able to create graphics within varying window panes that can be moved and/or re-referenced. For example, creating the graphical menu within a pane and referencing it on every graphics page, therefore not rebuilding thus allowing for a single spot for updates that get pushed to all the pages that reference it.
    - n. The ability to create re-usable cascading menus.
    - o. The ability to have multiple instances of a graphic and edit one instance to change all.
  3. Additionally, the Graphics Editor portion of the Engineering Software shall provide the following capabilities:
    - a. Create and save pages.
    - b. Group and ungroup symbols.
    - c. Modify an existing symbol.
    - d. Modify an existing graphic page.
    - e. Rotate and mirror a symbol.
    - f. Place a symbol on a page.
    - g. Place analog dynamic data in decimal format on a page.
    - h. Place binary dynamic data using state descriptors on a page.
    - i. Create motion through the use of animated .gif files or JavaScript.
    - j. Place test mode indication on a page.
    - k. Place manual mode indication on a page.
    - l. Place links using a fixed symbol or flyover on a page.
    - m. Links to other graphics.
    - n. Links to web sites.
    - o. Links to notes.

- p. Links to time schedules.
  - q. Links to any .exe file on the operator work station.
  - r. Links to .doc files.
  - s. Assign a background color.
  - t. Assign a foreground color.
  - u. Place alarm indicators on a page.
  - v. Change symbol/text/value color as a function of an analog variable.
  - w. Change a symbol/text/value color as a function of a binary state.
  - x. Change symbol/text/value as a function of a binary state.
  - y. All symbols used by Schneider Electric EcoBuilding Business in the creation of graphic pages shall be saved to a library file for use by the owner.
- I. The software shall allow for the automatic collection of data and reporting from any controller or NSC. The frequency of data collection shall be user-configurable.
- J. Alarm Management
- 1. The software shall be capable of accepting alarms directly from NSCs or controllers, or generating alarms based on evaluation of data in controllers and comparing to limits or conditional equations configured through the software. Any alarm (regardless of its origination) will be integrated into the overall alarm management system and will appear in all standard alarm reports, be available for operator acknowledgment, and have the option for displaying graphics, or reports.
  - 2. Alarm management features shall include:
    - a. A minimum of 1000 alarm notification levels at the NSC, workstation, and webstation levels.
    - b. Each notification level will establish a unique set of parameters for controlling alarm display, distribution, acknowledgment, keyboard annunciation, and record keeping.
    - c. At the Enterprise level the minimum number of active and viewable alarms shall be 10,000.
    - d. It shall be possible for the user to sort, filter and search on any available criteria such as priority, category, origin, alarm type, etc.
    - e. An active alarm viewer shall be included which can be customized for each user or user type to a hide or display any alarm attributes.
    - f. It shall be possible to present alarms with configurable colors based on priority, category, origin, alarm type, etc.
    - g. It shall be possible to linking files/documents/hyperlinks/navigation links/graphics link to an alarm for easy access upon occurrence
    - h. Automatic logging in the database of the alarm message, point name, point value, source device, timestamp of alarm, username and time of acknowledgement, username and time of alarm silence (soft acknowledgement).
    - i. Alarm notifications must support multiple distribution methods within one notification
    - j. On alarm, it shall be possible to notify via email to a preconfigured list of recipients . through a Simple Mail Transfer Protocol (SMTP) or secure email using Simple Mail Transfer Protocol Secure (SMTPS). No special software interfaces shall be required and no email client software must be running in order for email to be distributed. The email notification shall be able to be sent to an individual user or a user group.
    - k. On alarm, it shall be possible to notify via SNMP
    - l. On alarm, it shall be possible to notify via file (on disk) that would be consumable by other alarm management services
    - m. An operator shall have the capability to assign an alarm to another user of the system.

- n. Individual alarms shall be able to be assigned to a user automatically via a preconfigured list of users and date/time. For example, a critical high temp alarm can be configured to be assigned to a Facilities Dept or to a Central Alarming workstation depending on time/date.
- o. Playing an audible sound on alarm initiation or return to normal.
- p. It shall be possible assigning a custom audio sound to each alarm / alarm-criteria ( priority, category, origin, alarm type, etc.)
- q. The active alarm viewer can be configured such that an operator must confirm that all of the steps in a check list have been accomplished prior to acknowledging the alarm.
- r. The active alarm viewer shall, if filtered, show the quantity of visible and total number of alarms that are not equal to 'normal' and the quantity of disabled and hidden alarms.
- s. The alarm viewer can be configured to auto hide alarms when triggered.
- t. An operator shall have the capability to save and apply alarm favorites.
- u. Alarms shall be configurable such that an operator must type in text in an alarm entry and/or pick from a drop-down list of user actions for certain alarms.
- v. Alarms shall be configurable such that an operator must type in text in an alarm entry and/or pick from a drop-down list of causes for certain alarms. This ensures accountability (audit trail) for the response to critical alarms.
- w. It shall be possible to configure user-actions via user/group permissions when responding to an alarm
- x. All operator actions responding to an alarm must be audit trailed.

K. Static Paginated Reporting / Custom Reporting

- 1. The BMS Software and Network Servers shall support built-in native reporting capability without dependency on any external software
- 2. It shall be possible to generate custom reports manually, via Schedule, Alarm triggered or custom conditions (e.g. program/schedule/etc.)
- 3. The Custom Reporting shall have no dependency on external database
- 4. The Custom Reporting shall have the capability of reporting on the full range of available data, most recent to historical data.
- 5. It shall be possible to generate reports containing current active alarms
- 6. The Building Management System software shall natively be capable of producing custom repots in txt, xlxs and pdf file formats.
- 7. The Custom Report capability at the BMS software shall support digital signing of pdf for traceability and authenticity.

L. Dashboards

- 1. Dashboards shall provide rapid identification of real-time and historical trends, including energy use, operational efficiencies and critical metrics.
- 2. Using the Native Web Browser interface the system must allow for the selection, from a wide range of layouts and widgets (dashboard components), of items to create Dashboards
- 3. System must allow for dashboard view customization and selection of data points via the web browser and w/o any tools or prior training.
- 4. Built-in dashboards - A basic set of dashboard components shall be provided as part of the project. At a minimum, the following dashboard components functionality shall be provided for the Owner's use:
  - a. Resource Utilization



- 1) This is used to illustrate the comparative consumption of a resource (like energy) over a flexible time period.
- 2) The information is ordered by location and multiple locations may be plotted on the same columnar chart for clear analysis and comparison.
- b. Utility Performance Index
  - 1) This enables the creation and visualization of one or more Key Performance Index (KPI) charts for comparisons of resource utilization efficiencies for multiple locations.
  - 2) A typical use of this is in displaying a "scatter plot" of consumption (y-axis) versus consumption per unit area (x-axis).
  - 3) For example, an "Energy" KPI can be displayed by selecting the locations of interest (e.g. all Offices on Campus), selecting the vertical axis variable as Electric Consumption (kWh) and the horizontal axis as a "normalized" metric, such as "kWh per Sft".
- c. Real time Gauges
  - 1) Gauges allow the Owner to track values such as temperature, pressure, humidity and level in real time.
- d. Historical Gauges
  - 1) Gauges allow calculation of values based on historical data; for instance presenting max/min/average temperature/pressure/humidity over a given period
- e. Period over Period Comparison
  - 1) It shall be possible to visually compare historical data (e.g. temperature, energy, etc.) across multiple overlapping time periods (hours, days, weeks, etc.)
5. Custom dashboard components –
  - a. Custom dashboard components shall be able to present any information from the BMS (e.g. system health data, alarms, trends, events, user access, etc.)
  - b. The BMS shall allow creation of customized dashboard components in to presenting meaningful information as per customer

M. Scheduling

1. From the workstation or webstation, it shall be possible to configure and download schedules for any of the controllers on the network.
2. Time of day schedules shall be in a calendar style and viewable in both a graphical and tabular view.
3. Schedules shall be programmable for a minimum of one year in advance.
4. To change the schedule for a particular day, a user shall simply select the day and make the desired modifications.
5. Additionally, from the operator webstations, each schedule will appear on the screen viewable as the entire year, monthly, week and day. A simple mouse click shall allow switching between views. It shall also be possible to scroll from one month to the next and view or alter any of the schedule times.
6. Schedules will be assigned to specific controllers and stored in their local RAM memory. Any changes made at the workstation will be automatically updated to the corresponding schedule in the controller.
7. It shall be possible to assign a lead schedule such that shadow/local schedules are updated based upon changes in the Lead.
8. It shall be possible to assign a list(s) of exception event days, dates, date ranges to a schedule.
9. It shall be possible to view combined views showing the calendar and all prioritized exemptions on one screen.

10. It should accommodate a minimum of 16 priority levels.
11. Values should be able to be controlled directly from a schedule, without the need for special program logic.

N. Programmer's Environment

1. Programming in the NSC shall be either in graphical block format or line-programming format or both.
2. Programming of the NSC shall be available offline from system prior to deployment into the field. All engineering tasks shall be possible, except, of course, the viewing of live tasks or values.
3. The programmer's environment will include access to a superset of the same programming language supported in the SDCUs.
4. NSC devices will support both script programming language as well as the graphical function block programming language. For both languages, the programmer will be able to configure application software for custom program development, and write global control programs. Both languages will have debugging capabilities in their editors.
5. It shall be possible to save custom programs as libraries for reuse throughout the system. A wizard tool shall be available for loading programs from a library file in the program editor.
6. The system shall be capable of creating 'custom types'. These types can be created within the programming environment, graphics, or as full controller 'templates' that can be pushed to any other variable pertaining to it to allow for singular reference to multiple objects. This allows easing of updating/changes allowing the use to make a singular change and push to all connected instances.
7. It shall be possible to view graphical programming live and real-time from the Workstation.
8. The system shall be capable of creating 'binding templates' allowing the user to bind multiple points to multiple objects all at once.
9. Key terms should appear when typing (IntelliType).
10. Applications should be able to be assigned different priorities and cycle times for a prioritized execution of different function.
11. The system shall be able to create objects that allow common objects such as power meters, VFD drives, etc. to be integrated into the system with simple import actions without the need of complicated programming or configuration setups.

O. Saving/Reloading

1. The workstation software shall have an application to save and restore NSC and field controller memory files.
2. For the NSC, this application shall not be limited to saving and reloading an entire controller – it must also be able to save/reload individual objects in the controller. This allows off-line debugging of control programs, for example, and then reloading of just the modified information.

P. Audit Trail

1. The workstation software shall automatically log and timestamp every operation that a user performs at a workstation, from logging on and off a workstation to changing a point value, modifying a program, enabling/disabling an object, viewing a graphic display, running a report, modifying a schedule, etc.
2. It shall be possible to view a history of alarms, user actions, and commands for any system object individually or at least the last 5000 records of all events for the entire system from Workstation.
3. The Enterprise server shall be able to store up to 5 million events.
4. The event view shall support viewing of up to 100,000 events.
5. It shall be possible to save custom filtered views of event information that are viewable and configurable in Workstation.
6. It shall be capable to search and view all forced values within the system.

- Q. Fault Tolerant Enterprise Server Operation (Top level NSC)
1. A single component failure in the system shall not cause the entire system to fail. All system users shall be informed of any detectable component failure via an alarm event. System users shall not be logged off as a result of a system failure or switchover.
- R. Web-based Operator Software
1. General:
    - a. Day-to-day operation of the system shall be accessible through a standard web browser interface, allowing technicians and operators to view any part of the system from anywhere on the network.
    - b. The system shall be able to be accessed on site via a mobile device environment with, at a minimum, access to overwrite and view system values.
    - c. Through the browser interface, operators must be able to view pre-defined groups of points, with their values updated automatically.
  2. Graphic Displays
    - a. The browser-based interface must share the same graphical displays as the Administration and Programming Workstations, presenting dynamic data on site layouts, floor plans, and equipment graphics. The browser's graphics shall support commands to change setpoints, enable/disable equipment and start/stop equipment.
    - b. Through the browser-based interface, operators must be able to navigate through the entire system, and change the value or status of any point in any controller. Changes are effective immediately to the controller, with a record of the change stored in the system database.
    - c. System shall have out-of-the-box dashboards that enable customizable views of live data which can be public to all users or capable to make them specific to a user based on log in credentials.
    - d. The user shall have the ability to create custom dashboards.
    - e. The dashboards shall have a kiosk mode which allows for occupant level data display on monitors or tablets throughout the building.
  3. Alarm Management
    - a. Systems requiring additional client software to be installed on a PC for viewing the webstation from that PC will not be considered.
    - b. Through the browser interface, a live alarm viewer identical to the alarm viewer on the Administration and Programming workstation shall be presented, if the user's password allows it. Users must be able to receive alarms, silence alarms, and acknowledge alarms through a browser. If desired, specific operator text must be able to be added to the alarm record before acknowledgement, attachments shall be viewable, and alarm checklists shall be available.
- S. Groups and Schedules
1. Through the browser interface, operators must be able to view pre-defined groups of points, with their values updated automatically.
  2. Through the browser interface, operators must be able to change schedules – change start and stop times, add new times to a schedule, and modify calendars.
- T. User Accounts and Audit Trail
1. The same user accounts shall be used for the browser interface and for the operator workstations. Operators must not be forced to memorize multiple passwords.
  2. All commands and user activity through the browser interface shall be recorded in the system's activity log, which can be later searched and retrieved by user, date, or both.

U. Web Services

1. The installed system shall be able to use web services to “consume” information within the Network Server/Controllers (NSCs) with other products and systems. Inability to perform web services within the NSCs will be unacceptable.
  - a. Shall be able to “consume” data into the system via SOAP and REST web services

**2.4 NETWORK SERVER CONTROLLERS (NSC)**

- A. Network Server Controllers shall combine both network routing functions, control functions, and server functions into a single unit.
- B. The BACnet NSC shall be classified as a “native” BACnet device, supporting the BACnet Network Server Controller (B-BC) profile. Controllers that support a lesser profile such as B-SA are not acceptable. NSCs shall be tested and certified by the BACnet Testing Laboratory (BTL) as BACnet Network Server Controllers (B-BC).
- C. The Network Server Controller shall provide the interface between the LAN or WAN and the field control devices, and provide global supervisory control functions over the control devices connected to the NRS.
- D. The NSCs shall be capable of whitelisting IPs to restrict access to a pre-defined list of hosts or devices.
- E. Whitelisting of file extensions for documents shall be capable.
- F. Encrypted and authenticated communication shall be configurable for non-open protocol communications using TLS 1.2.
- G. The NSCs shall support Simple Network Management Protocol version 3 (SNMPv3) for monitoring of the NSCs using a Network Management Tool.
- H. The NSCs shall support remote system logging for used by System Information and Event Monitoring (SIEM) software.
- I. They shall also be responsible for monitoring and controlling their own HVAC equipment such as an AHU or boiler.
- J. They shall also contain graphics, trends, trend charts, alarm views, and other similar presentation objects that can be served to workstations or web-based interfaces. A sufficient number of NSCs shall be supplied to fully meet the requirements of this specification and the attached point list.
- K. It shall be capable of executing application control programs to provide:
  1. Calendar functions
  2. Scheduling
  3. Trending
  4. Alarm monitoring and routing
  5. Time synchronization by means of an Internet site including automatic synchronization
  6. Native integration of LonWorks controller data and Modbus controller data or BACnet controller data and Modbus controller data
  7. Network Management functions for all LonWorks based devices
- L. Hardware Specifications
  1. Memory:
    - a. The operating system of the controller, application programs, and all other portions of the configuration database, shall be stored in non-volatile, FLASH memory. Servers/Controllers

shall contain enough memory for the current application, plus required history logging, plus a minimum of 20% additional free memory.

2. Each NRC shall provide the following on-board hardware for communication:
  - a. Two 10/100b Ethernet for communication to Workstations, other NRCs, IP field bus controllers, other SDCUs, and onto the internet.
    - 1) The two Ethernet ports shall support active switch and BACnet/IP communication protocols.
    - 2) Support IPv4 addressing
    - 3) Ethernet port 1 shall support static or DHCP client configuration for communication to Workstation or other NSCs
    - 4) Ethernet port 2 shall support switch mode or DHCP server to set addressing of DHCP client devices
    - 5) It shall be possible to disable Ethernet port 2
    - 6) In DHCP server mode, the Ethernet port 2 shall support 50 BACnet/IP field controllers in daisy chain configuration directly from the port
    - 7) Each NSC shall be able to support a total of 250 IP SDCUs in daisy chain configuration (5 sub networks via switch)
    - 8) If using RSTP (Rapid Spanning Tree Protocol) with a managed switch (with IEEE 802.1W or IEEE 802.1Q-2014 support), Ethernet port 2 shall support up to 39 devices
    - 9) Each NSC shall be able to support a total of 234 IP SDCUs in RSTP configuration (6 sub networks via managed switch)
    - 10) Where a switch is needed, use a Cisco 9000 Catalyst or IE switch, EtherWAN EX63402-01B, or other equal and approved equivalent.
  - b. Two RS-485 ports for communication to BACnet MSTP bus or serial Modbus (software configurable)
  - c. One TP/FT port for communication to LonWorks devices.
  - d. One device USB port
  - e. One host USB port
3. The NSC shall conform to a small footprint no larger than 100W x 125H x 75D mm (3.94W x 4.92H x 2.95D in).

M. Modular Expandability:

1. The system shall employ a modular I/O design to allow expansion. Input and output capacity is to be provided through plug-in modules of various types. It shall be possible to combine I/O modules as desired to meet the I/O requirements for individual control applications.
2. One shall be able to "hot-change" (hot-swap) the I/O modules preserving the system on-line without any intervention on the software; addressing and configuration shall be automatic.
3. If for any reason the backplane of the modular I/O system were to fail, I/O module addresses will be protected.

N. Hardware Override Switches:

1. All digital outputs shall, optionally, include three position manual override switches to allow selection of the ON, OFF, or AUTO output state. These switches shall be built into the unit and shall provide feedback to the controller so that the position of the override switch can be obtained through software. In addition each analog output shall be equipped with an override potentiometer to allow manual adjustment of the analog output signal over its full range, when the 3 position manual override switch is placed in the ON position.

O. Universal Input Temperatures

1. All universal inputs directly connected to the NSC via modular expansion shall be capable of using the following thermistors for use in the system without any external converters needed.
  - a. 10 kohm Type I (Continuum)

- b. 10k ohm Type II (I/NET)
    - c. 10k ohm Type III (Satchwell)
    - d. 10k ohm Type IV (FD)
    - e. Linearized 10k ohm Type V (FD w/11k shunt)
    - f. Linearized 10k ohm (Satchwell)
    - g. 1.8k ohm (Xenta)
    - h. 1k ohm (Balco)
    - i. 20k ohm (Honeywell)
    - j. 2.2k ohm (Johnson)
  - 2. In addition to the above, the system shall be capable of using the below RTD sensors, however it is not required that all universal inputs be compatible with them.
    - a. PT100 (Siemens)
    - b. PT1000 (Sauter)
    - c. Ni1000 (Danfoss)
- P. Local Status Indicator Lamps:
- 1. The NSC shall provide as a minimum LED indication of CPU status, Ethernet LAN status, and field bus status. For each input or output, provide LED indication of the value of the point (On/Off). The LED indication shall support software configuration to set whether the illumination of the LED corresponds to On or Off or whether the color when illuminated is Red or Green.
- Q. Real Time Clock (RTC):
- 1. Each NSC shall include a real time clock, accurate to 10 seconds per day. The RTC shall provide the following: time of day, day, month, year, and day of week. Each NSC will allow for its own UTC offset, depending upon the time zone. When the time zone is set, the NSC will also store the appropriate times for daylight savings time.
  - 2. The RTC date and time shall also be accurate, up to 10 days, when the NSC is powerless.
  - 3. No batteries may be used to for the backup of the RTC.
- R. Power Supply:
- 1. The 24 VDC power supply for the NSCs shall provide 30 watts of available power for the NSC and associated IO modules. The system shall support the use of more than one power supply if heavily power consuming modules are required.
  - 2. The power supply, NSC, and I/O modules shall connect power wise and communication wise via the separate terminal base allowing for ease of replacement and no separate or loose wiring.
- S. Automatic Restart After Power Failure:
- 1. Upon restoration of power after an outage, the NSC shall automatically and without human intervention update all monitored functions, resume operation based on current, synchronize time and status, and implement special start-up strategies as required.
- T. Data Retention:
- 1. During a power failure, the NSC shall retain all programs, configuration data, historical data, and all other data that is configured to be retained. There shall be no time restriction for this retention and it must not use batteries to achieve it.
- U. Software Specifications
- 1. The operating system of the controller, application programs, and all other portions of the configuration database such as graphics, trends, alarms, views, etc., shall be stored in non-volatile, FLASH memory. There will be no restrictions placed on the type of application programs in the

system. Each NSC shall be capable of parallel processing, executing all control programs simultaneously. Any program may affect the operation of any other program. Each program shall have the full access of all I/O facilities of the processor. This execution of control function shall not be interrupted due to normal user communications including interrogation, program entry, printout of the program for storage, etc.

2. Each NSC shall have an available capacity of 4 GB of memory. This shall represent 2 GB for application and historical data and 2 GB dedicated for backup storage.

V. User Programming Language:

1. The application software shall be user programmable. This includes all strategies, sequences of operation, control algorithms, parameters, and setpoints. The source program shall be either a script-based structured text or graphical function block based and fully programmable by the user. The language shall be structured to allow for the configuration of control programs, schedules, alarms, reports, telecommunications, local displays, mathematical calculations, and histories. Users shall be able to place comments anywhere in the body of either script or function block programs.
2. Network Server Controllers that use a "canned" program method will not be accepted.

W. Control Software:

1. The NSC shall have the ability to perform the following pre-tested control algorithms:
  - a. Proportional, Integral plus Derivative Control (PID)
  - b. Two Position Control
  - c. Digital Filter
  - d. Ratio Calculator
  - e. Equipment Cycling Protection

X. Mathematical Functions:

1. Each controller shall be capable of performing basic mathematical functions (+, -, \*, /), squares, square roots, exponential, logarithms, Boolean logic statements, or combinations of both. The controllers shall be capable of performing complex logical statements including operators such as >, <, =, and, or, exclusive or, etc. These must be able to be used in the same equations with the mathematical operators and nested up to five parentheses deep.

Y. NSCs shall have the ability to perform any or all of the following energy management routines:

1. Time of Day Scheduling
2. Calendar Based Scheduling
3. Holiday Scheduling
4. Temporary Schedule Overrides
5. Optimal Start
6. Optimal Stop
7. Night Setback Control
8. Enthalpy Switchover (Economizer)
9. Peak Demand Limiting
10. Temperature Compensated Duty Cycling
11. CFM Tracking
12. Heating/Cooling Interlock
13. Hot/Cold Deck Reset
14. Hot Water Reset
15. Chilled Water Reset

16. Condenser Water Reset
17. Chiller Sequencing

Z. History Logging:

1. Each NSC controller shall be capable of LOCALLY logging any input, output, calculated value or other system variable either over user defined time intervals ranging from 1 second to 1440 minutes or based upon a user configurable change of value. A minimum of 1000 logs, with a minimum of 100,000 records, shall be stored. Each log can record either the instantaneous, average, minimum or maximum value of the point. Logged data shall be downloadable to a higher level NSC long term archiving based upon user-defined time intervals, or manual command.
2. For extended trend logging a minimum of 1500 trends shall be capable, with a minimum number of 600,000 records within.
3. Management of a power meter replacement to ensure meter log data is accurate shall be possible in the NSC.
4. Every hardware input and output point, hosted within the NSC and attached I/O modules, shall be trended automatically without the requirement for manual creation, and each of these logs shall log values based upon a change of value and store at least 500 trend samples before replacing the oldest sample with new data.
5. The presentation of logged data shall be built into the server capabilities of the NSC. Presentation can be in time stamped list formats or in a chart format with fully configurable pen colors, weights, scales and time spans.
6. Tooltips shall be present, magnetic, and visible based on users preference.
7. Comments shall be visible whenever viewing the trend log list.
8. System shall give indication of memory usage and be able to alert the user if too many logs are allocated.
9. The BMS software and Network Servers shall support recording of all historical data, independent of any limitation in its local memory, which will be readily available for reporting and analysis without additional configurations or actions.
10. All historical data shall be available for use by the operator to access in BMS or a third-party reporting systems.

AA. Alarm Management:

1. For each system point, alarms can be created based on high/low limits or in comparison to other point values. All alarms will be tested each scan of the NSC and can result in the display of one or more alarm messages or reports.
2. There is no limit to the number of alarms that can be created for any point
3. Alarms can be configured to be generated based upon a single system condition or multiple system conditions.
4. Alarms will be generated based on an evaluation of the alarm conditions and can be presented to the user in a fully configurable order, by priority, by time, by category, etc. These configurable alarm views will be presented to a user upon logging into the system regardless of whether the log in takes place at a WorkStation or a Webstation.
5. The alarm management system shall support the ability to create and select cause and action notes to be selected and associated with an alarm event. Checklists shall also be possible in order to present to an operator a suggested mode of troubleshooting. When acknowledging an alarm, it shall be possible to assign it to a user of the system such that the user is notified of the assignment and is made responsible for the alarm resolution.
6. Alarms must be capable of being routed to any BACnet workstation that conforms to the B-OWS device profile and uses the BACnet/IP protocol.

BB. Embedded Web Server



1. Each NSC must have the ability to serve out web pages containing the same information that is available from the WorkStation. The development of the screens to accomplish shall not require any additional engineering labor over that required to show them at the WorkStation itself.
2. The NSC shall be configurable to logging all Embedded Web Server access attempts
3. The NSC shall have the option to redirect HTTP based Embedded Web Server connections to secure, HTTPS connections.
4. The NSC shall authenticate and authorize all users connecting to the Embedded Web Server
5. The NSC shall provide to ability to configure an automatic logoff for Embedded Web Server users that have not had any activity for an adjustable time period.

CC. The NSC controller shall comply with the following regulatory certifications

1. CE – EN 61000-6-3
2. CE – EN 61000-6-2
3. CE – EN 61010-1
4. CE – EN 61326-1
5. FCC CFR 47 Part 15 Class A
6. RCM
7. RoHS 2011/65/EU
8. China RoHS SJ/T 11364-2014
9. UL916 Energy Management equipment

DD. HMI

1. The NSC shall have an option for a tablet display
2. The tablet display shall be an industrial grade Human Machine Interface (HMI) that can be locked to the building management application to create a dedicated tool for local operation and maintenance.
3. The tablet display shall provide an easy-to-use interface through which users and engineers can locally access NSC's
4. The tablet display shall always start in a kiosk mode ensuring the end user can only use the device using the installed integration with the NSC.
5. The tablet display shall always require a password on start up
6. The tablet display shall require a password after a defined period of inactivity
7. The tablet display shall support being handheld or being installed on a control cabinet.
8. The tablet display user interface shall provide touchscreen navigation making it easy to operate and maintain the system.
9. The tablet display shall support robust physical panel mounting mechanisms provided with the product.
10. The tablet display shall have a screen size of 255mm or 10.1 inches
11. The tablet display shall support a screen resolution of 1280 by 800 pixels
12. The tablet display shall have a 16:10 aspect ratio
13. The tablet display shall be based on the Android platform
14. The tablet display shall have an IP54 rated frame that helps protect against dust and moisture.

15. The tablet display shall be powered by a 24 VDC power supply
  16. The tablet display can be powered by a 24 VDC through the Y-shaped cable
  17. The tablet display shall be able to communicate with the NSC over a wired (USB) connection running BACnet IP over USB.
  18. The tablet display shall have an accessory Wi-Fi Module is an option instead of using USB for communication.
    - a. Through the Wi-Fi module, you can establish wireless communication between the tablet display and the NCS connected to a wireless access point.
    - b. The Wi-Fi module shall have an adhesive mount Wi-Fi antenna.
    - c. The Wi-Fi module shall be compliant with IEEE 802.11 b/g/n
    - d. The Wi-Fi module shall support enhanced wireless security using 64-bit and 128-bit WEP encryption
  19. The tablet display shall connect to the NSC using only secure, HTTPS connections via the WebStation functionality of the NSC
  20. The tablet display shall connect using a specific user and password combination defined as part of the NSC configuration
- EE. Zoning (software defined zoning)
1. It shall be possible for BMS software and Network Servers (NSCs) to support synchronized control of lights, blinds and HVAC across multiple floorplan scenarios.
  2. It shall be possible to create multiple synchronized control scenarios of lights/blinds/HVAC based to accommodate different floor plan scenarios.
  3. It shall be possible to change synchronized control of lights/blinds/HVAC from one floorplan scenario to another manually or automatically.
  4. It shall be possible to adapt synchronized controls of lights, blinds and HVAC to a different floorplan scenario using any device running a standard web browser.
  5. It shall be possible for the administrator to manage user and group permissions to view / re-configure floor plan scenarios.

## **2.5 BACNET IP FIELDBUS CONTROLLERS**

- A. Controllers – BACnet/IP Protocol
1. All BACnet/IP Fieldbus controllers shall be BACnet Testing Laboratory listed (v12 or later) as specified BACnet Advanced Application Controller (B-AAC)
  2. All BACnet/IP Fieldbus controllers shall use the following communication specifications and achieve performance as specified herein:
    - a. All controllers shall be able to communicate peer-to-peer without the need for a NSC
    - b. Any BACnet/IP Fieldbus controllers on the Ethernet Data Link/Physical layer shall be able to act as a Master to allow for the exchange and sharing of data variables and messages with any other controller connected on the same communication cabling. Slave controllers are not acceptable.
- B. The BACnet/IP Fieldbus controllers shall be equipped with 2x 10/100bT Ethernet communication ports with active switch and will support BACnet/IP communication protocols with the following configurations:
1. Supporting IPv4 addressing
  2. Supporting Static IP setting, DHCP client and Auto-IP address acquisition
  3. It shall be possible to disable Ethernet port 2

C. Topologies

1. BACnet/IP Fieldbus controllers shall support daisy chain topology of up to 50 controllers. In case of any disruption to the communication, a system alarm shall notify the NSC/BMS of the point disruption has occurred.
2. BACnet/IP Fieldbus Controllers shall support RSTP loop whereby up to 39 controllers are supported.
  - a. In case of any disruption there shall be no communication interruption
  - b. In case of any disruption there shall be system alarms that will inform the operator of the disruption

D. Performance

1. Each BACnet/IP Fieldbus Controllers shall have a 32-bit microprocessor operating at 500 MHz and support a BACnet protocol stack in accordance with the ANSI/ASHRAE Standard 135-2008 and the BACnet Device Profile supported.
2. They shall be multi-tasking, real-time digital control processors consisting of communication controllers, controls processing, power supplies with built-in inputs and outputs.

E. Programmability

1. The BACnet/IP Fieldbus controllers shall support both script programming language and graphical that will be consistent with the NSC.
2. The control program will reside within the same enclosure as the input/output circuitry, that reads inputs and controls outputs
3. All control sequences programmed into the BACnet/IP Fieldbus Controllers shall be stored in non-volatile memory, which is not dependent upon the presence of a battery, to be retained.
4. BACnet/IP Fieldbus controllers shall communicate with the Network Server Controller (NSC) via a BACnet/IP connection at a baud rate of not less than 100 Mbps
5. BACnet/IP Fieldbus controllers shall support a dedicated communications port for connecting and supplying power to a matching room temperature and/or humidity sensor and/or CO2 and/or presence detector that does not utilize any of the I/O points of the controller.
6. BACnet/IP Fieldbus controllers (Excluding VAV) shall support an add-on display to supply and provide access in real-time for monitoring inputs and overriding of outputs
7. The override functionality must be supported by a dedicated processor to assure reliable operation (overriding of output)
8. Each BACnet/IP Fieldbus controller shall have sufficient memory, to support its own operating system and databases, including:
  - a. Control processes
  - b. Energy management applications
  - c. Alarm management
  - d. Historical/trend data
  - e. Maintenance support applications
  - f. Custom processes
  - g. Manual override monitoring
9. Each BACnet/IP Fieldbus controller shall support local trend data up to 2x the built-in I/O and at a minimum be capable of holding 5 days @ 15 min intervals locally.
10. The BACnet/IP Fieldbus controller analog or universal input shall use a 16 bit A/D converter.
11. The BACnet/IP Fieldbus controller analog or universal output shall use a 10 bit D/A converter.
12. Built-in I/O: each BACnet/IP Fieldbus controllers shall support:

- a. At minimum 8 and up to 20 configurable IO channels to monitor and to control the following types of inputs and outputs without the addition of equipment inside or outside the DDC Controller cabinet.
  - 1) Universal Inputs – the following thermistors for use in the system without any external converters needed.
    - a) 10 kohm Type I (Continuum)
    - b) 10 kohm Type II (I/NET)
    - c) 10 kohm Type III (Satchwell)
    - d) 10 kohm Type IV (FD)
    - e) Linearized 10 kohm Type V (FD w/11k shunt)
    - f) Linearized 10 kohm (Satchwell)
    - g) 1.8 kohm (Xenta)
    - h) 1 kohm (Balco)
    - i) 20 kohm (Honeywell)
    - j) 2.2 kohm (Johnson)
    - k) PT100 (Siemens)
    - l) PT1000 (Sauter)
    - m) Ni1000 (Danfoss)
  - 2) Analog inputs
    - a) Current Input - 0-20 mA
    - b) Voltage Input 0-10 Vdc
  - 3) Digital inputs from dry contact closure, pulse accumulators, voltage sensing.
  - 4) Digital outputs
  - 5) Analog outputs of 4-20 mA and/or 0-10 Vdc
- 13. Real Time Clock (RTC):
  - a. Provide internal clocks for all BACnet Controllers (B-AAC) using BACnet time synchronization services.
    - 1) Automatically synchronize system clocks daily from an operator-designated controller.
    - 2) The system shall automatically adjust for daylight saving time.
  - b. Each BACnet/IP Fieldbus controller shall include a real time clock, accurate to +/-1 minute per month.
  - c. The RTC shall provide the following: time of day, day, month, year, and day of week.
  - d. The RTC date and time shall also be accurate up to 7 days, from when the BACnet/IP Fieldbus controller has lost power with no reliance on.
- 14. The BACnet/IP Fieldbus controller for Variable Air Volume (VAV) applications
  - a. The BACnet/IP Fieldbus controller for VAV applications shall include a built-in 'flow thru' differential pressure transducer
  - b. The VAV differential pressure transducer shall have a measurement range of 0 to 1 in. W.C. and measurement accuracy of  $\pm 5\%$  at 0.001 to 1 in. W.C. and a minimum resolution of 0.001 in. W.C., insuring primary air flow conditions shall be controlled and maintained to within  $\pm 5\%$  of setpoint at the specified minimum and maximum air flow parameters
  - c. The BACnet/IP FieldBus controller for VAV applications shall support a dedicated commissioning tool for air flow balancing
  - d. The BACnet/IP Fieldbus controller for VAV applications shall require no programing for air balancing algorithm
  - e. All balancing parameters shall be synchronized in NSC
- 15. Each BACnet/IP Fieldbus controller shall have a minimum of 10% spare capacity for each point type represented on the controller for future point connection
- 16. Power Requirements. 24VDC (21 to 33 VDC) and 24 VAC +/-20% with local transformer power
- 17. Each BACnet/IP Fieldbus controller shall be accredited for smoke control and smoke management within a fully IP control solution

18. The BACnet/IP Fieldbus controller shall comply with the following regulatory certifications
  - a. CE - EMCD 2014/30/EU
  - b. CE LVD 2014/35/EU
  - c. FCC CFR 47 Part 15 Class B
  - d. RCM
  - e. RoHS 2011/65/EU
  - f. China RoHS SJ/T 11364-2014
  - g. UL2043 (Plenum space mounting)
  - h. UL916 Open-Energy Management equipment
  - i. UL916 Energy Management equipment
19. Intelligent Space Sensor Interface –
  - a. The BACnet/IP Fieldbus controllers shall support a dedicated RJ45 communication port to communicate and power up to 4 intelligent wall mount sensors without the use of on-board inputs or outputs
  - b. It shall be possible to disable the RJ45 communication port.
20. The BACnet/IP Fieldbus controller for Connected Room solutions
  - a. All BACnet/IP Fieldbus controllers shall be BACnet Testing Laboratory listed (v14 or later) as specified BACnet Advanced Application Controller (B-AAC)
  - b. All BACnet/IP Fieldbus controllers shall use the following communication specifications and achieve performance as specified herein:
    - 1) All controllers shall be able to communicate peer-to-peer without the need for an NSC
    - 2) Any BACnet/IP Fieldbus controllers on the Ethernet Data Link/Physical layer shall be able to act as a Master to allow for the exchange and sharing of data variables and messages with any other controller connected on the same communication cabling. Slave controllers are not acceptable.
  - c. The BACnet/IP Fieldbus controllers shall be equipped with 2x 10/100bT Ethernet communication ports with active switch and will support BACnet/IP communication protocols with the following configurations:
    - 1) Supporting IPv4 addressing
    - 2) Supporting Static IP setting, DHCP client and Auto-IP address acquisition
    - 3) It shall be possible to disable Ethernet port 2
    - 4) Each BACnet/IP controller shall be configurable to restrict communications to only whitelisted IP addresses.
  - d. Topologies
    - 1) BACnet/IP Fieldbus controllers shall support daisy chain topology of up to 50 controllers. In case of any disruption to the communication, a system alarm shall notify the NSC/BMS of the point disruption has occurred.
    - 2) BACnet/IP Fieldbus Controllers shall support RSTP loop whereby up to 39 controllers are supported.
      - a) In case of any disruption there shall be no communication interruption
      - b) In case of any disruption there shall be system alarms that will inform the operator of the disruption
  - e. Performance

- 1) Each BACnet/IP Fieldbus Controllers shall have a 32-bit microprocessor operating at 500 MHz and support a BACnet protocol stack in accordance with the ANSI/ASHRAE Standard 135-2012 and the BACnet Device Profile supported.
  - 2) They shall be multi-tasking, real-time digital control processors consisting of communication controllers, controls processing, power supplies with built-in inputs and outputs.
  - 3) Each BACnet/IP Fieldbus Controllers shall support upgrade of its firmware with no impact to its operation
- f. Programmability
- 1) The BACnet/IP Fieldbus controllers shall support both script programming language and graphical that will be consistent with the NSC.
  - 2) The control program will reside within the same enclosure as the input/output circuitry, that reads inputs and controls outputs
  - 3) All control sequences programmed into the BACnet/IP Fieldbus Controllers shall be stored in non-volatile memory, which is not dependent upon the presence of a battery, to be retained.
  - 4) The BACnet/IP Fieldbus controllers shall communicate with the Network Server Controller (NSC) via a BACnet/IP connection at a baud rate of not less than 100 Mbps
  - 5) The BACnet/IP Fieldbus controllers shall support two RS485 communication ports for connecting and supplying power to a range of protocol types
    - a) BACnet/IP Fieldbus controllers shall support configurable selection of the supported protocol on the RS485 communications ports,
    - b) BACnet/IP Fieldbus controllers shall support a communications capability for connecting and supplying power to a matching room temperature and/or humidity sensor and/or CO2 and/or presence detector that does not utilize any of the I/O points of the controller.
    - c) BACnet/IP Fieldbus controllers shall support a communications capability for connecting and supplying power to a matching connected module for the purpose of control of lights and blinds that do not utilize any of the I/O points of the controller
    - d) BACnet/IP Fieldbus controllers shall support a communications capability for connecting to open market Modbus devices
- g. BACnet/IP Fieldbus controllers shall support on-board Bluetooth Low Energy radio to support:
- 1) Mobile application shall be available for controller commissioning
  - 2) Mobile applications shall be available for building occupants
  - 3) It shall be possible to disable the Bluetooth Low Energy Radio
  - 4) The BACnet/IP Fieldbus controller shall support a connection for an external antenna.
- h. BACnet/IP Fieldbus controllers shall support an optional plug-in Zigbee 3.0 radio for the purpose of connecting to wireless Zigbee sensors and devices.
- 1) It shall be possible to connect to up to 16 Zigbee sensors or devices
  - 2) The controller shall support a range of different sensors and devices for easy commissioning
  - 3) The controller shall be able to connect to a Green Power Zigbee temperature and humidity sensor with 10 years of battery life
  - 4) The controller shall be able to connect to a Zigbee temperature, humidity and CO2 sensor with 10 years of battery life
- i. Controllers that only support older versions of the Zigbee 3.0 are not approved due to the lack of security layer

- j. It shall be possible to connect the Zigbee radio directly to the BACnet/IP RP Fieldbus controller.
- k. It shall be possible to install the Zigbee radio in the ceiling using a purpose designed extension cable and ceiling housing when radio reception at the controller may be compromised.
- l. Each BACnet/IP Fieldbus controller shall have sufficient memory, to support its own operating system and databases, including:
  - 1) Control processes
  - 2) Energy management applications
  - 3) Alarm management
  - 4) Historical/trend data
  - 5) Maintenance support applications
  - 6) Custom processes
- m. In the case of communication disruption between the BACnet/IP Fieldbus controller and NSC/BMS, each BACnet/IP Fieldbus controller shall support storage of local trend data up to 2x the number of its built-in I/O at the collection rate of 5 min for 5 days.
- n. The BACnet/IP Fieldbus controller analog or universal input shall use a 16-bit A/D converter.
- o. The BACnet/IP Fieldbus controller analog or universal output shall use a 10-bit D/A converter.
- p. Built-in I/O: each BACnet/IP Fieldbus controllers shall support:
  - 1) Up to 8 configurable IO channels to monitor and to control the following types of inputs and outputs without the addition of equipment inside or outside the DDC Controller cabinet.
    - a) Universal Inputs – the following thermistors for use in the system without any external converters needed.
    - b) 10K Ohm Type I (Continuum)
    - c) 10K Ohm Type II (I/NET)
    - d) 10K Ohm Type III (Satchwell)
    - e) 10K Ohm Type IV (FD)
    - f) Linearized 10K Ohm Type V (FD w/11k shunt)
    - g) Linearized 10K Ohm (Satchwell)
    - h) 1.8K Ohm (Xenta)
    - i) 1K Ohm (Balco)
    - j) 20K Ohm (Honeywell)
    - k) 2.2K Ohm (Johnson)
    - l) PT100 (Siemens)
    - m) PT1000 (Sauter)
    - n) Ni1000 (Danfoss)
    - o) Voltage Input - 0-10 Vdc
    - p) Digital inputs from dry contact closure, pulse accumulators, voltage sensing.
    - q) Digital outputs
    - r) Analog outputs 0-10 Vdc
- q. Internal Clock
  - 1) Provide internal clocks for all BACnet Controllers (B-AAC) using BACnet time synchronization services.

- a) Automatically synchronize system clocks daily from an operator-designated controller.
  - b) The system shall automatically adjust for daylight saving time.
- 2) Each BACnet/IP Fieldbus controller shall include a real time clock, accurate to +/-1 minute per month.
- 3) The RTC shall provide the following: time of day, day, month, year, and day of week.
- 4) The RTC date and time shall also be accurate up to 7 days, from when the BACnet/IP Fieldbus controller has lost power with no reliance on batteries
- r. Each BACnet/IP Fieldbus controller shall have a minimum of 10% spare capacity for each point type represented on the controller for future point connection
- s. Power Requirements. 24VDC (21 to 33 VDC) and 24 VAC +/-20% with local transformer power
- t. Power Requirements. A line voltage version shall be available 230 VAC
- u. In the case of power disruption, each BACnet/IP Fieldbus controller shall support power failure recovery within 10 seconds and resume operation from where the disruption had occurred
- v. The BACnet/IP Fieldbus controller shall be able to be plenum mounted (UL2043 compliant)
- w. The BACnet/IP Fieldbus controller shall meet the open class standard of UL916 permitting its installation without secondary enclosure where appropriate
- x. The BACnet/IP Fieldbus controller shall comply with the following regulatory certifications
  - 1) CE - EMCD 2014/30/EU
  - 2) CE LVD 2014/35/EU
  - 3) FCC CFR 47 Part 15 Class B
  - 4) RCM
  - 5) RoHS 2011/65/EU
  - 6) China RoHS SJ/T 11364-2014
  - 7) UL2043 (Plenum space mounting)
  - 8) UL916 Open-Energy Management equipment
  - 9) UL916 Energy Management equipment
- y. Intelligent Space Sensor Interface - The BACnet/IP Fieldbus controllers shall support an RJ45 communication port to communicate and power up to 4 intelligent wall mount sensors without the use of on-board inputs or outputs
  - 1) It shall be possible to disable the RJ45 communication port
- z. Integrations - Connected Room
  - 1) The controller shall be capable of controlling lighting fixtures thru various open protocols listed below. this shall be achieved thru on-board I/O on the controller or via expansion modules (of the BACnet/IP controller) and will be capable of supporting the following:
    - a) The DALI expansion module shall be certified and capable of full DALI2 control for individual and groups of lights (up to 32 ballasts or LED drivers and a maximum of 16 groups).
    - b) During zero light output it shall be possible to fully shut down the ballasts thereby minimizing any leakage current.
    - c) The controller / expansion module shall be certified for multi-master functionality thereby allowing DALI pushbuttons sensors and dimmers to be mounted on the DALI communication bus.



- d) The DALI expansion module shall be rated to 10A in total (Max 5A per channel)
  - e) The DALI expansion module shall support DALI version-1 control gear
  - f) The DALI expansion module shall support DALI-1 version control gear.
  - g) The DALI expansion module shall support Discharge lamps
  - h) The DALI expansion module shall support LED
  - i) The DALI expansion module shall support color control (Device type 8)
  - j) The DALI expansion module shall support feedback from control gear (including lamp failure feedback)
  - k) The DALI expansion module shall support addressing and grouping of control gear.
  - l) The 0-10V expansion modules shall be capable of on/off/dim of light using 0-10V dimming signal.
  - m) During zero light output it shall be possible to fully shut down the ballasts thereby minimizing any leakage current.
  - n) It shall be possible to interface and control lighting that are dimmed using Phase cut dimming the controller/interface shall be capable of automatically detecting the appropriate leading or trailing edge control mechanism that may be needed depending on the type of load.
- 2) The controller shall be capable of controlling blinds and shades thru various open protocols listed below. this shall be achieved thru on-board I/O on the controller or via expansion modules (of the BACnet/IP controller) and will be capable of supporting the following:
- a) The controller/ expansion modules shall be capable of interfacing with and controlling blind motors that uses low voltage Standard Motor Interface (SMI) communication.
  - b) The controller/ expansion modules shall be capable of interfacing with and controlling blind motors that use high voltage SMI communication.
  - c) The controller/ expansion modules shall be capable of interfacing with and controlling blind motors using low voltage (24V) relays.
  - d) The controller/ expansion modules shall be capable of interfacing with and controlling blind motors using line voltage relays.
- 3) It shall be possible for the controller to interface with third party Modbus devices sensors, pushbuttons and glass touch panels
- 4) It shall be possible for the controller to interface with KNX sensors and push button devices
- 5) It shall be possible for the controller to communicate to wireless devices such as sensors, power meters, and wireless lighting control gateways via Zigbee 3.0.
- a) Controllers using earlier Zigbee standards shall not be acceptable.
- 6) It shall be possible to rezone and partition spaces using a graphical software, that works using floor plan maps and allows the user to create zones by positioning HVAC equipment, lights, blinds and sensors directly on the map. It shall then be possible to assign them to zones
- 7) It shall be possible to connect to four advanced sensors with capability for sensing occupancy and light levels. The sensor shall be powered by the controller and will not require batteries for operation.
- 8) it shall be possible to control lights/ blinds and HVAC functions such as fan speed and temperature via an optional remote control that can be located anywhere conveniently within the room or mounted on the wall and communicates to the controller securely via blue-tooth

- 9) It shall be possible for the controller to measure the power consumed by the different devices connected to the controller such as lighting HVAC and blinds
  - 10) Lighting Control Interfaces
    - a) Mobile Based Personal Control Interface - an integrated mobile application shall provide current status of the light and blind in the room and enable each room occupant with the ability to:
    - b) Dim, brighten lights and turn them on and off
    - c) And for blinds: tilt, vertical up or down
    - d) Ability to select scenes
    - e) Control HVAC
  - 11) The Connected Room Solution will be fully programmable capable of supporting different control strategies locally.
  - 12) Standard applications shall be available for download from a central repository, which will allow common configurations such as those listed below to be easily configured.
    - a) Occupied state
    - b) Unoccupied state
    - c) Load Shed Mode
    - d) Daylight Harvesting
    - e) Time Clock Scheduling
  - 13) The integration modules shall comply with the following regulatory certifications
    - a) CE - EMCD 2014/30/EU
    - b) CE LVD 2014/35/EU
    - c) FCC CFR 47 Part 15 Class B
    - d) RCM
    - e) RoHS 2011/65/EU
    - f) China RoHS SJ/T 11364-2014
    - g) UL2043 (Plenum space mounting)
    - h) UL916 Energy Management
21. The BACnet/IP Fieldbus controller for remote IO
- a. It shall be possible to extend Inputs / Outputs required in NSC or BACnet/IP Fieldbus Controllers over the IP network
  - b. The BACnet/IP IO expansion device shall be equipped with 2x 10/100bT Ethernet communication ports with active switch supporting the following configurations:
    - 1) Supporting IPv4 addressing
    - 2) Supporting Static IP setting, DHCP client and Auto-IP address acquisition
    - 3) It shall be possible to disable Ethernet port 2
  - c. The BACnet/IP IO expansion device shall support daisy and RSTP topologies
  - d. The BACnet/IP I/O expansion device shall be capable of sharing its local I/O resources with one or multiple applications distributed across one or multiple NSCs or BACnet/IP Fieldbus Controllers.
  - e. The BACnet/IP I/O expansion device shall support BACnet Alarm and Trend locally
  - f. Outputs of the BACnet/IP I/O expansion device shall support user configurable fallback value that is triggered in case of communication disruption.
- F. Commissioning Tool - The BACnet/IP Fieldbus controllers shall be supported via a dedicate mobile based commissioning tool for configuration, programming, air balancing and I/O checkout:

1. The Commissioning Tool shall be supported across: iOS, Android and Windows 10 platforms
  2. The Commissioning Tool shall be available for download on App Store, Google Store and Windows Store
  3. Commissioning Tool Interface to BACnet/IP Fieldbus controllers shall be via Bluetooth or via a Wi-Fi access point on the LAN
  4. Functionality
    - a. Device Configuration – the Commissioning Tool shall be able to set or edit all Network configurations associated with the BACnet/IP Fieldbus controller
    - b. Programming – The Commissioning Tool shall be able to load offline engineered applications directly in to the controller directly
    - c. Air Balancing
      - 1) The Commissioning Tool shall allow the air balancer to manually control the action of the actuator including the following function: open VAV damper, close VAV damper, open all VAV dampers, and close all VAV dampers.
      - 2) The Commissioning Tool shall be able to generate Air Balancing report
    - d. DALI lighting commissioning
      - 1) The Commissioning tool shall allow the engineer to test the operation of DALI control gear.
      - 2) The commissioning tool shall allow the engineer to wink the DALI control gear.
      - 3) The commissioning tool shall indicate the status of the DALI control gear.
    - e. 0-10V lighting commissioning
      - 1) The Commissioning tool shall allow the engineer to test the operation of 0-10V lights.
      - 2) The commissioning tool shall allow the engineer to wink the 0-10V lights.
    - f. Blind and shade commissioning
      - 1) The Commissioning tool shall allow the engineer to test the operation of blinds and shades.
  5. IO Checkout
    - a. The Commissioning Tool shall be able to support overriding of the outputs and reading value of inputs live that includes light and blind points and their configuration
    - b. The Commissioning Tool shall be able to support generation of I/O checkout report
  6. There shall be no limit to the number of Commissioning Tools that can be used on a network segment.
- G. Intelligent Space Sensors - The BACnet/IP Fieldbus controller shall support a dedicated RJ45 communication port to communicate and power up to 4 intelligent wall mount sensors without the use of on board inputs or outputs
1. The Intelligent Space Sensor shall communicate with the BACnet/IP Fieldbus controller through the sensor port and via category 5 or category 6 cable
  2. The Intelligent Space Sensor shall provide 2 RJ45 communication ports that will allow communication with parent BACnet/IP Field controller upstream and additional Intelligent Space Sensors downstream
  3. The Intelligent Space Sensor shall provide ambient space condition sensing without the use of hardware I/O
- H. Each Intelligent Space Sensor shall provide a color touch display with:
1. Minimum 61 mm (2.4") by 61 mm (2.4") display

2. Backlit
- I. The Intelligent Space Sensor shall be capable of displaying measured space temperature from 0 to 50 °C (32 to 122 °F) with accuracy of  $\pm 0.2$  °C ( $\pm 0.4$  °F) selectable for 0.1 or 1 degree display resolution of °F or °C
  1. Sensing Element: 10k Type 3 Thermistor
  2. Accuracy of  $\pm 0.2$  °C ( $\pm 0.4$  °F)
  3. Resolution: 0.1 or 1 degree display resolution
  4. Range: 0 to 50 °C (32 to 122 °F)
- J. The Intelligent Space Sensor shall have the option for humidity sensor support sensing humidity from 0 % RH to 100 % RH Digital humidity indication (selectable for 0.1 or 1% RH with selectable display resolution of 0.1 or 1 % RH)
  1. Accuracy:  $\pm 2$  % RH
  2. Resolution: 0.1 or 1 % RH
  3. Range: 0 % RH to 100 % RH
- K. The Intelligent Space Sensor shall have the option for support of CO2 sensor with display resolution with 0 to 2000 ppm resolution
  1. Accuracy:  $\pm 30$  ppm  $\pm 2\%$  of measured value
  2. Range: 0 to 2,000 ppm
  3. Operating elevation: 0 to 16,000 ft.
  4. Temperature dependence: 0.11% FS per °F
  5. Stability:  $< 2\%$  of FS over life of sensor (15 years)
  6. Sensing method: Non-dispersive infrared (NDIR), diffusion sampling
- L. The Intelligent Space Sensor shall have the option for motion sensor
- M. Display options: The Intelligent Space Sensor shall be capable of displaying the following elements:
  1. Space temperature
  2. Cooling space temperature set point
  3. Heating space temperature set point
  4. Current heating or cooling mode
  5. Current occupancy mode
  6. Fan speed
  7. Current time
  8. Light control
  9. Blind adjustment
  10. Scene selection

## 2.6 BACNET FIELDBUS AND BACNET SDCUS

- A. Networking
  1. IP Network: All devices that connect to the WAN shall be capable of operating at 10 megabits per second or 100 megabits per second.
  2. IP To Field Bus Routing Devices
    - a. A Network Server Controller shall be used to provide this functionality.

- b. These devices shall be configurable locally with IP crossover cable and configurable via the IP network.
  - c. The routing configuration shall be such that only data packets from the field bus devices that need to travel over the IP level of the architecture are forwarded.
- B. Field Bus Wiring and Termination
  - 1. The wiring of components shall use a bus or daisy chain concept with no tees, stubs, or free topology.
  - 2. Each field bus shall have a termination resistor at both ends of each segment.
  - 3. The field bus shall support the use of wireless communications.
- C. Repeaters
  - 1. Repeaters are required to connect two segments.
  - 2. Repeaters shall be installed in an enclosure. The enclosure may be in an interstitial space.
- D. Field Bus Devices
  - 1. General Requirements
    - a. Devices shall have a light indicating that they are powered.
    - b. Devices shall be locally powered. Link powered devices (power is furnished from a central source over the field bus cable) are not acceptable.
    - c. Application programs shall be stored in a manner such that a loss of power does not result in a loss of the application program or configuration parameter settings. (Battery backup, flash memory, etc.)
- E. Advance Application Controllers (B-AAC)
  - 1. The key characteristics of a B-AAC are:
    - a. They have physical input and output circuits for the connection of analog input devices, binary input devices, pulse input devices, analog output devices, and binary output devices. The number and type of input and output devices supported will vary by model.
    - b. They may or may not provide support for additional input and output devices beyond the number of circuits that are provided on the basic circuit board. Support for additional I/O shall be provided by additional circuit boards that physically connect to the basic controller.
    - c. The application to be executed by a B-AAC is created by an application engineer using the vendor's application programming tool.
    - d. If local time schedules are embedded, the B-AAC shall support the editing of time schedule entries from any BACnet OWS that supports the BACnet service for writing of time schedule parameters.
    - e. If local trend logging is embedded, the B-AAC shall support the exporting of trend log data to any BACnet OWS that supports the read range BACnet service for trending.
    - f. If local alarm message initiation is embedded, the B-AAC shall:
      - 1) Deliver alarm messages to any BACnet OWS that supports the BACnet service for receiving alarm messages and is configured to be a recipient of the alarm message.
      - 2) Support alarm acknowledgement from any BACnet OWS that supports the BACnet service for executing alarm/event acknowledgement,
    - g. Shall support the reading of analog and binary data from any BACnet OWS or Building Controller that supports the BACnet service for the reading of data.
    - h. Shall support the control of the out of service property and assignment of value or state to analog and binary objects from any BACnet OWS that supports writing to the out of service property and the value property of analog and binary objects.

- i. Shall support the receipt and response to Time Synchronization commands from a BACnet Building Controller.
  - j. Shall support the "Who is" and "I am." BACnet services.
  - k. Shall support the "Who has" and "I have." BACnet services.
- 2. Analog Input Circuits
  - a. The resolution of the A/D chip shall not be greater than 0.01 Volts per increment. For an A/D converter that has a measurement range of 0 to 10 VDC and is 10 bit, the resolution is 10/1024 or 0.00976 Volts per increment.
  - b. For non-flow sensors, the control logic shall provide support for the use of a calibration offset such that the raw measured value is added to the (+/-) offset to create a calibration value to be used by the control logic and reported to the Operator Workstation (OWS).
  - c. For flow sensors, the control logic shall provide support for the use of an adjustable gain and an adjustable offset such that a two point calibration concept can be executed (both a low range value and a high range value are adjusted to match values determined by a calibration instrument).
  - d. For non-linear sensors such as thermistors and flow sensors the B-AAC shall provide software support for the linearization of the input signal.
- 3. Binary Input Circuits
  - a. Dry contact sensors shall wire to the controller with two wires.
  - b. An external power supply in the sensor circuit shall not be required.
- 4. Pulse Input Circuits
  - a. Pulse input sensors shall wire to the controller with two wires.
  - b. An external power supply in the sensor circuit shall not be required.
  - c. The pulse input circuit shall be able to process up to 20 pulses per second.
- 5. True Analog Output Circuits
  - a. The logical commands shall be processed by a digital to analog (D/A) converter chip. The 0% to 100% control signal shall be scalable to the full output range which shall be either 0 to 10 VDC, 4 to 20 milliamps or 0 to 20 milliamps or to ranges within the full output range (Example: 0 to 100% creates 3 to 6 VDC where the full output range is 0 to 10 VDC).
  - b. The resolution of the D/A chip shall not be greater than 0.04 Volts per increment or 0.08 milliamps per increment.
- 6. Binary Output Circuits
  - a. Single pole, single throw or single pole, double throw relays with support for up to 230 VAC and a maximum current of 2 amps.
  - b. Voltage sourcing or externally powered triacs with support for up to 30 VAC and 0.5 amps at 24 VAC.
- 7. Program Execution
  - a. Process control loops shall operate in parallel and not in sequence unless specifically required to operate in sequence by the sequence of control.
  - b. The sample rate for a process control loop shall be adjustable and shall support a minimum sample rate of 1 second.
  - c. The sample rate for process variables shall be adjustable and shall support a minimum sample rate of 1 second.
  - d. The sample rate for algorithm updates shall be adjustable and shall support a minimum sample rate of 1 second.
  - e. The application shall have the ability to determine if a power cycle to the controller has occurred and the application programmer shall be able to use the indication of a power cycle to modify the sequence of controller immediately following a power cycle.
- 8. Local Interface

- a. The controller shall support the connection of a portable interface device such as a laptop computer or vendor unique hand-held device. The ability to execute any tasks other than viewing data shall be password protected. Via this local interface, an operator shall be able to:
  - 1) Adjust application parameters.
  - 2) Execute manual control of input and output points.
  - 3) View dynamic data.

F. Application Specific Devices

1. Application specific devices shall have fixed function configurable applications.
2. If the application can be altered by the vendor's application programmable tool, the device is an advanced application controller and not an application specific device.
3. Application specific devices shall be BTL certified.

G. Room controllers

1. For connected room solutions that do not require integrated lighting and blind busses built into a singular unit, the system shall include a BACnet MS-TP enabled controller specifically designed for room control.
2. The controller shall communicate via BACnet MS-TP. It should also be capable of MODBUS RTU communication.
3. The controller shall be capable of controlling fan coil units, cooling VVT zones with reheat, fin-tube radiators, cabinet heaters, radiant panel heaters, electric re-heat zones, terminal reheats, rooftop units (1H1C, 2H2C, 3H2C, MH2C), or heat pumps, if necessary.
4. The controller shall house an onboard temperature sensor, and options for onboard humidity and occupancy sensor.
5. The controller shall utilize a touch screen interface and have multiple options for casings and fascias. The screen shall be a TFT transmissive LED backlit LCD touchscreen with at least 5 color options.
6. Controller will have password protection to prevent unauthorized access to the configuration menu parameters.
7. The controller will have integrated Zigbee wireless communications with predefined profiles for Zigbee door and window switches, occupancy sensors, water leakage detectors, CO2 sensors, and additional temperature and humidity sensors.
8. The controller will be capable of hosting at least 10 Zigbee sub devices.
9. The controller will be capable of being programmed with customizable scripts via the open programming language Lua. It shall be equipped with at least 256KB of SRAM with 80KB configurable/reserved for Lua scripting purposes.

## 2.7 DDC SENSORS AND POINT HARDWARE

A. Temperature Sensors

1. All temperature devices shall use precision thermistors accurate to +/- 1 degree F over a range of -30 to 230 degrees F. Space temperature sensors shall be accurate to +/- .5 degrees F over a range of 40 to 100 degrees F.
2. Room Sensor: Standard space sensors shall be available in an [off white][black] enclosure made of high impact ABS plastic for mounting on a standard electrical box. Basis of Design: Veris TW Series

- a. Where manual overrides are required, the sensor housing shall feature both an optional sliding mechanism for adjusting the space temperature setpoint, as well as a push button for selecting after hours operation.
    - b. Where a local display is specified, the sensor shall incorporate an LCD display for viewing the space temperature, setpoint and other operator selectable parameters. Using built in buttons, operators shall be able to adjust setpoints directly from the sensor.
  3. Duct Probe Sensor: Sensing element shall be fully encapsulated in potting material within a stainless steel probe. Useable in air handling applications where the coil or duct area is less than 14 square feet. Basis of Design: Veris TD Series
  4. Duct Averaging Sensor: Averaging sensors shall be employed in ducts which are larger than 14 square feet. The averaging sensor tube shall contain at least one thermistor for every 3 feet, with a minimum tube length of 6 feet. The averaging sensor shall be constructed of rigid or flexible copper tubing. Basis of Design: Veris TA Series
  5. Pipe Immersion Sensor: Immersion sensors shall be employed for measurement of temperature in all chilled and hot water applications as well as refrigerant applications. Provide sensor probe length suitable for application. Provide each sensor with a corresponding pipe-mounted sensor well, unless indicated otherwise. Sensor wells shall be stainless steel for non-corrosive fluids below 250 degrees F and 300 series stainless steel for all other applications. Basis of Design: Veris TI Series
  6. Outside Air Sensor: Provide the sensing element on the building's north side. Sensing element shall be fully encapsulated in potting material within a stainless steel probe. Probe shall be encased in PVC solar radiation shield and mounted in a weatherproof enclosure. Operating range -40 to 122 F, Basis of Design: Veris TO Series
  7. A pneumatic signal shall not be allowed for sensing temperature.
- B. Humidity Wall Transmitter
1. Transmitters shall be accurate to +/- 2 % at full scale.
  2. Transmitter shall have replaceable sensing element.
  3. Sensor type shall be thin-film capacitive.
  4. Sensor element shall contain multipoint calibration on-board in nonvolatile memory
  5. Operating range shall be 0 - 100% RH noncondensing, 50 to 95 F
  6. Output shall be field selectable 4-20 mA or 0-5/0-10 VDC.
  7. Transmitter shall accept 12-30 VDC or 24 VAC supply power.
  8. Transmitter shall be available in an off white enclosure made of high impact ABS plastic for mounting on a standard electrical box.
  9. Transmitter shall have option of having an LCD display
  10. Transmitter shall have option of being NIST certified
  11. Transmitter shall have option of an integrated temperature sensor
  12. Basis of Design: Veris HWL Series
- C. Humidity Duct Transmitter
1. Transmitters shall be accurate to +/- 2 % at full scale.
  2. Transmitter shall be fully encapsulated in potting material within a stainless steel probe.
  3. Transmitter shall have replaceable sensing element.
  4. Sensor type shall be thin-film capacitive.
  5. Sensor element shall contain multipoint calibration on-board in nonvolatile memory
  6. Operating range shall be 0 - 100% RH noncondensing, -40 to 122 F
  7. Output shall be 4-20 mA or 0-5/0-10 VDC.
  8. Transmitter shall accept 12-30 VDC or 24 VAC supply power.
  9. Transmitter shall have option of being NIST certified



10. Transmitter shall have option of an integrated temperature sensor
11. Basis of Design: Veris HD Series

D. Humidity Outdoor Transmitter

1. Transmitters shall be accurate to +/- 2% at full scale.
2. Transmitter shall be fully encapsulated in potting material within a stainless steel probe. Probe shall be encased in PVC solar radiation shield and mounted in a weatherproof enclosure.
3. Transmitter shall have replaceable sensing element.
4. Sensor type shall be thin-film capacitive.
5. Sensor element shall contain multipoint calibration on-board in nonvolatile memory
6. Operating range shall be 0 - 100% RH noncondensing, -40 to 122 F
7. Output shall be 4-20 mA or 0-5/0-10 VDC.
8. Transmitter shall accept 12-30 VDC or 24 VAC supply power.
9. Transmitter shall have option of being NIST certified
10. Transmitter shall have option of an integrated temperature sensor
11. Basis of Design: Veris HO Series

E. Carbon Dioxide Wall Transmitter:

1. Sensor type shall be Non-dispersive infrared (NDIR).
2. Accuracy shall be  $\pm 30$  ppm  $\pm 2\%$  of measured value with annual drift of  $\pm 10$  ppm. Minimum five year recommended calibration interval.
3. Repeatability shall be  $\pm 20$  ppm  $\pm 1\%$  of measured value
4. Response Time shall be <60 seconds for 90% step change
5. Outputs shall be field selectable [Analog: 4-20mA or 0-5/0-10VDC][Protocol: Modbus or BACnet] with [SPDT Relay 1A@30VDC][temperature setpoint slider]
6. Transmitter shall accept 12-30 VDC or 24 VAC supply power.
7. Temperature Range: [32° to 122°F (CO2 only)][50° to 95°F (with humidity option)]
8. Output range shall be programmable 0-2000 or 0-5000 ppm
9. Transmitter shall be available in an off white enclosure for mounting on a standard electrical box.
10. Transmitter shall have an option of an LCD display for commissioning and provide additional faceplate to conceal LCD display where occupants may misinterpret CO2 readings.
11. Transmitter shall have option of an integrated temperature sensor and/or humidity sensor
12. Basis of Design: Veris CWL

F. Carbon Dioxide Duct Transmitter:

1. Sensor type shall be Non-dispersive infrared (NDIR).
2. Accuracy shall be  $\pm 30$  ppm  $\pm 2\%$  of measured value with annual drift of  $\pm 10$  ppm. Minimum five year recommended calibration interval.
3. Repeatability shall be  $\pm 20$  ppm  $\pm 1\%$  of measured value
4. Response Time shall be <60 seconds for 90% step change
5. Outputs shall be field selectable Analog: 4-20mA or 0-5/0-10VDC with SPDT Relay 1A@30VDC
6. Transmitter shall accept 12-30 VDC or 24 VAC supply power.
7. Temperature Range: 32° to 122°F
8. Output range shall be programmable 0-2000 or 0-5000 ppm
9. Enclosure shall not require remote pickup tubes and make use of integrated H-beam probe to channel air flow to sensor.
10. Enclosure lid shall require no screws and make use of snap on features for attachment

11. Enclosure shall be made of high impact ABS plastic
12. Transmitter shall have option of an LCD display
13. Transmitter shall have option of an integrated temperature sensor and/or humidity sensor
14. Basis of Design: Veris CDL

G. Air Pressure Transmitters.

1. Sensor shall be microprocessor profiled ceramic capacitive sensing element
2. Transmitter shall have 14 selectable ranges from 0.1 – 10" WC
3. Transmitter shall be +/- 1% accurate in each selected range including linearity, repeatability, hysteresis, stability, and temperature compensation.
4. Transmitter shall be field configurable to mount on wall or duct with static probe
5. Transmitter shall be field selectable for Unidirectional or Bidirectional
6. Maximum operating pressure shall be 200% of design pressure.
7. Output shall be field selectable 4-20 mA or 0-5/0-10 VDC linear.
8. Transmitter shall accept 12-30 VDC or 24 VAC supply power
9. Response time shall be field selectable T95 in 20 sec or T95 in 2 sec
10. Transmitter shall have an LCD display
11. Units shall be field selectable for WC or PA
12. Transmitter shall have provision for zeroing by pushbutton or digital input.
13. Transmitter shall be available with a certification of NIST calibration
14. Basis of Design: Veris model PXU.

H. Liquid Differential Pressure Transmitters:

1. Transmitter shall be microprocessor based
2. Transmitter shall use two independent gauge pressure sensors to measure and calculate differential pressure
3. Transmitter shall have 4 switch selectable ranges
4. Transmitter shall have test mode to produce full-scale output automatically.
5. Transmitter shall have provision for zeroing by pushbutton or digital input.
6. Transmitter shall have field selectable outputs of 0-5V, 0-10V, and 4-20mA.
7. Transmitter shall have field selectable electronic surge damping
8. Transmitter shall have an electronic port swap feature
9. Transmitter shall accept 12-30 VDC or 24 VAC supply power
10. Sensor shall be 17-4 PH stainless steel where it contacts the working fluid.
11. Performance:
  - a. Accuracy shall be  $\pm 1\%$  F.S. and  $\pm 2\%$  F.S. for lowest selectable range
  - b. Long term stability shall be  $\pm 0.25\%$
  - c. Sensor temperature operating range shall be  $-4^{\circ}$  to  $185^{\circ}\text{F}$
  - d. Operating environment shall be  $14^{\circ}$  to  $131^{\circ}\text{F}$ ; 10-90% RH noncondensing
  - e. Proof pressure shall be 2x max. F.S. range
  - f. Burst pressure shall be 5x max. F.S. range
12. Transmitter shall be encased in a NEMA 4 enclosure
13. Enclosure shall be white powder-coated aluminum
14. Transmitter shall be available with a certification of NIST calibration
15. Transmitter shall be preinstalled on a bypass valve manifold
16. Basis of Design: Veris PW

- I. Current Sensors
  - 1. Current status switches shall be used to monitor fans, pumps, motors and electrical loads. Current switches shall be available in split core models, and offer either a digital or an analog signal to the automation system.
- J. Current Status Switches for Constant Load Devices
  - 1. General: Factory programmed current sensor to detect motor undercurrent situations such as belt or coupling loss on constant loads. Sensor shall store motor current as operating parameter in non-volatile memory. Push-button to clear memory.
  - 2. Visual LED indicator for status.
  - 3. Split core sensor, induced powered from monitored load and isolated to 600 VAC rms. Sensor shall indicate status from 0.5 A to 175 A.
  - 4. Normally open current sensor output. 0.1A at 30 VAC/DC.
  - 5. Basis of Design: Veris Model H608.
- K. Current Status Switches for Constant Load Devices (Auto Calibration)
  - 1. General: Microprocessor based, self-learning, self-calibrating current switch. Calibration-free status for both under and overcurrent, LCD display, and slide-switch selectable trip point limits. At initial power-up automatically learns average current on the line with no action required by the installer
  - 2. Split core sensor, induced powered from monitored load and isolated to 600 VAC rms. Sensor shall indicate status from 2.5 A to 200 A.
  - 3. Display: Backlit LCD; illuminates when monitored current exceeds 4.5A
  - 4. Nominal Trip Point:  $\pm 40\%$ ,  $\pm 60\%$ , or on/off (user selectable)
  - 5. Normally open current sensor output. 0.1A at 30 VAC/DC.
  - 6. Basis of Design: Veris Model H11D.
- L. Current Status Switches for Variable Frequency Drive Application
  - 1. General: Microprocessor controlled, self-learning, self-calibrating current sensor to detect motor undercurrent and overcurrent situations such as belt loss, coupling shear, and mechanical failure on variable loads. Sensor shall store motor current as operating parameter in non-volatile memory. Push-button to clear memory and relearn.
  - 2. Visual LED indicator for status.
  - 3. Alarm Limits:  $\pm 20\%$  of learned current in every 5 Hz freq. band
  - 4. Split core sensor, induced powered from monitored load and isolated to 600 VAC rms. Sensor shall indicate status from 1.5 A to 150 A and from 12 to 115 Hz.
  - 5. Normally open current sensor output. 0.1A at 30 VAC/DC.
  - 6. Basis of Design: Veris Model H614.
- M. Liquid Flow, Insertion Type Turbine Flowmeter:
  - 1. General: Turbine-type insertion flow meter designed for use in pipe sizes 1 1/2" and greater. Available in hot tap configuration with isolation valves and mounting hardware to install or remove the sensor from pipeline that is difficult to shut down or drain
  - 2. Performance:
    - a. Accuracy  $\pm 1\%$  of rate over optimum flow range;  $\geq 10$  upstream and  $\geq 5$  downstream straight pipe diameters, uninterrupted flow
    - b. Repeatability  $\pm 0.5\%$
    - c. Velocity Range: 0.3 to 20 FPS
    - d. Pressure Drop 0.5 psi or less @ 10 ft/sec for all pipe sizes 1.5" dia and up
    - e. Pressure Rating: 1000 psi @ 70°F

3. Maximum Temperature Rating: 300°F
  4. Materials: Stainless Steel or Brass body; Stainless steel impeller
  5. Transmitter:
    - a. Power Supply: 12 - 30VAC or 8 - 35VDC.
      - 1) Output: [Frequency][4-20 mA][Scaled Pulse]
    - b. Temperature Range: 14° to 150°F
    - c. Display: 8 character 3/8" LCD (Optional)
    - d. Enclosure: NEMA 4, Polypropylene with Viton® sealed acrylic cover
  6. Basis of Design: Veris SDI series
- N. Liquid Flow/Energy Transmitter, Non-invasive Ultrasonic (Clamp-on):
1. General: Clamp-on digital correlation transit-time ultrasonic flow meter designed for clean liquids or liquids containing small amounts of suspended solids or aeration. Optional temperature sensors for BTU calculations.
  2. Liquid: water, brine, raw sewage, ethylene, glycol, glycerin, others. Contact manufacturer for other fluid compatibility
  3. Pipe Surface Temperature: Pipe dia 1/2" to 2": -40-185°F; Pipe dia > 2": -40-250°F
  4. Performance:
    - a. Flow Accuracy:
      - 1) Pipe dia 1/2" to 3/4" 1% of full scale
      - 2) Pipe dia 1" to 2" 1% of reading from 4-40 FPS
      - 3) Pipe dia 2" to 100" 1% of reading from 1-40 FPS
    - b. Flow Repeatability ±0.01% of reading
    - c. Velocity Range: (Bidirectional flow)
      - 1) Pipe dia 1/2" to 2" 2 to 40 FPS
      - 2) Pipe dia 2" to 100" 1 to 40 FPS
    - d. Flow Sensitivity 0.001 FPS
    - e. Temperature Accuracy (energy): 32-212°F; Absolute 0.45°F; Difference 0.18°F
    - f. Temperature Sensitivity: 0.05°F
    - g. Temperature Repeatability: ±0.05% of reading
  5. Transmitter:
    - a. Power Supply: 95 to 264 VAC, 47 to 63 Hz or 10 to 28 VDC.
    - b. Output: [RJ45][Modbus TCP/IP][Ethernet/IP][BACnet/IP][Pulse][4-20 mA][RS-485 Modbus RTU]
    - c. Temperature Range: -40 to +185°F
    - d. Display: 2 line backlit LCD with keypad
    - e. Enclosure: NEMA 4, (IP65), Powder-coated aluminum, polycarbonate
  6. Agency Rating: UL 1604, EN 60079-0/15, CSA C22.2, CSA Class 1 (Pipe > 2")
  7. Basis of Design: Veris FST & FSR series
- O. Analog Electric/Pneumatic Transducer:
1. General: Micro-controlled poppet valve for high accuracy and with no air loss in the system. Field configurable for pressure sensing in multiple applications.
  2. Power Supply: 22-30VDC, 20-30VAC
  3. Control Input: 4-20mA, 0-10V, 0-5V; jumper selectable
  4. Performance:
    - a. Accuracy: 1% full scale; combined linearity, hysteresis, repeatability
    - b. Compensated Temperature Range: 25° to 140°F

- c. Temp Coefficient:  $\pm 0.05\%$ °C
- d. Operating Environment: 10-90% RH, non-condensing; 25° to 140°F
- 5. Supply Pressure: 45 psig max.
- 6. Manual Override: Jumper selectable mode, digital pushbutton adjust
- 7. Alarm Contact: 100mA@30VAC/DC (Optional)
- 8. Control Range 0-20 psig or 3-15 psig; jumper selectable
- 9. Pressure Differential 0.1 psig (supply to branch)
- 10. Pressure Indication Electronic, 3-1/2 digit LCD
- 11. Housing: Mounted on standard SnapTrack; Optional clear dust cover
- 12. Basis of Design: Veris EP Series

P. Water Control Valves

1. Ball Valves

a. ½" to ¾" Ball Valve

- 1) Forged brass body rated at no less than 600 psi, chrome plated brass ball with blowout proof stem or optional stainless steel ball with blowout proof stem,
- 2) Valves are to be in two-way and three-way configurations.
- 3) Connection: Female NPT end fittings, Teflon® PTFE seat, characterizing disc glass filled PEEK providing equal percentage flow curve on two-way valve.
- 4) Operating Temperature 20...250°F chilled or hot water with up to 60% glycol solution.
- 5) Two-way and Bypass port should be ANSI Class IV (0.01% of Cv) seat leakage.
- 6) Rangeability must be at least 300:1.
- 7) Tool-less actuator connection.
- 8) System Static Pressure Limit should be 600 psig (4137 Pa)
- 9) Basis of Design: Schneider Electric VBB/VBS Ball Valves, or approved equal.

b. ½" to 3" 2-way and ½" to 2" 3-way Ball Valves

- 1) Valves must be for control of hot or chilled water, or solutions of up to 50% glycol.
- 2) Ball valves must have close-offs of 40...130 psi depending on size.
- 3) Valves will provide CVs from 0.33...266 depending on size.
- 4) Valve characterizing insert, is to be made of glass-filled Noryl™ and provide equal percentage flow.
- 5) Valve body is to be made of forged brass ASTM B283-06 and rated for static pressure of 360 psi at fluid temperatures of 20...250°F (-7...121°C).
- 6) All valves are to have balls made of nickel/chromium plated brass with two-way valves having stainless steel balls as an option. All valve stems are to be stainless steel with reinforce Teflon® EPDM O-ring seals.
- 7) 2-way valves are to be ANSI Class IV (0.01% of Cv) shutoff. 3-way valves are to be ANSI Class IV (0.01% of Cv) piped coil-side outlet to the port A only.
- 8) Fluid (water) temperature are a minimum 20°F (-7°C) and a maximum of 250°F (121°C).
- 9) Basis of Design: Schneider Electric VB-2000, or approved equal.

2. Globe Valves (Bronze ½" to 2")

- a. Control Valves: Factory fabricated, with body material, and pressure class based on maximum pressure and temperature rating of piping system with a body rating of not less than 400 psig at 150°F, 321 psig at 281°F per ANSI B16.15.
- b. Valves two way NPS 2" and Smaller: Operator, stem and plug assembly, and spring-loaded PTFE/EPDM valve stem packing cartridge must be removable for future replacement to restore the valves back to their original condition. Material grade properties must meet the fluid temperature and pressure requirements:
  - 1) Standard duty bronze body, 316 stainless steel vertical stem, brass plug, soft seal, and bronze seat, renewable packing cartridge, and screwed/sweat/flared ends.

- Valves shall have allowable media temperature of 20°F ...281°F to assure reliability with dual temperature applications.
- 2) Heavy duty bronze body, 316 stainless steel vertical stem, 316 stainless steel plug, soft seal, and 316 stainless steel seat, renewable packing cartridge, and screwed ends. Valves shall have allowable media temperature of 20°F ...340°F to assure to assure reliability with dual temperature applications.
  - 3) High temperature bronze body, 316 stainless steel vertical stem, 316 stainless steel plug, and 316 stainless steel seat, renewable packing cartridge, and screwed ends. Valves shall have allowable media temperature of 20°F ...400°F.
- c. Two-way fluid system globe valves shall have the following characteristics:
- 1) Rangeability: Greater than 100:1 for all valves with flow coefficients of 0.4 and higher to provide stable control under light load conditions.
  - 2) Maximum Allowable Seat Leakage: Standard and heavy duty valves must be designed to meet ANSI Class V (0.0005 ml per minute per "of orifice diameter per psi differential) up to 35 psi close off differential pressure and ANSI Class IV seat leakage (maximum 0.01% of full open valve capacity) above 35 psi with appropriate actuator. High temperature valves must meet ANSI Class III seat leakage (maximum 0.1% of full open valve capacity).
  - 3) The valve must be able to operate with a full-open operating differential of no less than 87 psi.
  - 4) Flow Characteristics: Modified equal percentage characteristics for standard duty water applications and modified linear for heavy duty and high temperature steam applications with gradual opening for light loads.
  - 5) Sizing:
    - a) Two Position Water: Water: Line size or size using a differential pressure of 1 psi.
    - b) Modulating Water: 5 PSI or twice the load pressure drop.
    - c) Pressure drop across steam valve at a maximum flow of 80 percent of inlet pressure up to 15 psig and 42% of absolute (gage pressure + 14.7) inlet pressure above 15 psig inlet.
    - d) 100 psi saturated steam maximum inlet pressure for heavy duty bronze body globe valves ½"...2".
    - e) 150 psi saturated steam maximum inlet pressure for high temperature bronze body globe valves ½"...2".
    - f) 35 psi saturated steam maximum inlet pressure for standard duty bronze body globe valves ½"...2".
- d. Valves 3-Way mixing (two inlets and one outlet) NPS 2" and Smaller:
- 1) Operator, stem and plug assembly, and spring-loaded PTFE/EPDM valve stem packing cartridge must be removable for future replacement to restore the valves back to their original condition. Material grade properties must meet the fluid temperature and pressure requirements:
    - a) Standard duty bronze body, 316 stainless steel vertical stem, brass plug, and bronze seat, renewable packing cartridge, and screwed or sweat ends. Valves shall have allowable media temperature of 20°F...281°F to assure reliability with dual temperature applications.
    - b) Heavy duty bronze body, 316 stainless steel vertical stem, 316 stainless steel plug, and 316 stainless steel seat, renewable disc and packing cartridge, and screwed ends. Valves shall have allowable media temperature of 20°F ...340°F to assure reliability with dual temperature applications.
- e. 3-Way mixing hydronic system globe valves shall have the following characteristics:
- 1) Rangeability: Greater than 100:1 for all valves to provide stable
  - 2) Maximum Allowable Seat Leakage: A port must be designed to meet ANSI Class V (0.0005 ml per minute per "of orifice diameter per psi differential) up to 35 psi close off differential pressure and ANSI IV seat leakage (maximum 0.01% of full open valve

- capacity) above 35 psi with appropriate actuator. B port must meet ANSI Class III seat leakage (maximum 0.1% of full open valve capacity).
- 3) The valve must be able to operate with a full-open operating differential of 87 psi.
  - 4) Flow Characteristics: Modified linear characteristics with gradual opening for light loads.
  - 5) Sizing: Modulating Water: Minimum 5 psi or at least equal to the load pressure drop.
- f. Valves 3-Way diverting (one inlet and two outlets) NPS 2" and Smaller:
- 1) Operator, stem and plug assembly, and spring-loaded PTFE/EPDM valve stem packing cartridge must be removable for future replacement to restore the valves back to their original condition. Valves must be designed specifically for diverting service, and mixing valves designed for mixing service must not be used for diverting applications. Material grade properties must meet the fluid temperature and pressure requirements:
    - a) Standard duty bronze body, 316 stainless steel vertical stem, brass plug, and bronze seat, renewable disc and packing cartridge, and screwed ends. Valves shall have allowable media temperature of 20°F ...281°F to assure reliability with dual temperature applications.
- g. 3-Way diverting hydronic system globe valves shall have the following characteristics:
- 1) Rangeability: Greater than 100:1 for all valves to provide stable control under light load conditions.
  - 2) Maximum Allowable Seat Leakage: ANSI Class III seat leakage (maximum 0.1% of full open valve capacity).
  - 3) Maximum Allowable Pressure Differential: 35 psi in an open position.
  - 4) Flow Characteristics: Modified linear characteristics with gradual opening for light loads.
  - 5) Sizing:
    - a) Modulating Water: Minimum 5 psi or at least equal to the load pressure drop.
- h. Required Certifications: Pressure Equipment Directive (PED 97/23/EC), RoHS (Restriction of Hazardous Substances) and REACH (Regulation, Evaluation, Authorization, and Restriction of Chemicals), Canadian Registration Number.
- i. Valve and Operator: To assure maximum performance and operation of the valve assembly both the valve and the actuator must be tested and approved by the valve manufacturer to assure compatibility of all components and performance to the specifications.
- j. Basis of Design: Schneider Electric Venta VB-7000, or approved equal.
3. Butterfly Valves
- a. Valve body are to be polyester coated iron ASTM A126 lug mating with ANSI class 125/150 flanges.
  - b. Disc Type: Ductile iron nylon 11 coated.
  - c. Valve Stem:
    - 1) 2...8" 416 stainless steel double D stem.
    - 2) 10...12" 316 stainless steel double D stem.
    - 3) 14" and larger: stainless steel round shaft woodruff key slot.
  - d. Valve seat: EPDM tongue and groove seat and molded O-ring flange seat
  - e. Flow Characteristics: Modified equal percentage.
  - f. Close-Off Pressure Rating: Bubble-tight shutoff (no leakage).
  - g. Valve fluid temperature rating: -40...250°F (-40...121°C) 9. Valve will have two (2) inch extended neck (because of heat). 10. Valve must except pneumatic or electric/electronic actuators 11. Valves must have a minimum of a two (2) year warranty.
  - h. Valve will have two (2) inch extended neck (because of heat).
  - i. Valve must accept pneumatic or electric/electronic actuators.
  - j. Valves must have a minimum of a two (2) year warranty.

4. Flanged Valves

- a. Bodies: Shall be American Factory fabricated with ASTM A 126 Class B cast iron body material with the pressure class within the maximum pressure and temperature rating of the piping system. (125 body rating with not less than 200 psig at 150°F, decreasing to 169 psig at 281°F per ANSA B16.1)
- b. Serviceability: 2-Way valve operators, stem and plug assemblies and spring-loaded PTFE/EPDM valve stem packing cartridges must be removable for future replacement to restore the valves back to their original condition.
- c. Construction: Material grades must meet the fluid temperature and pressure requirement temperatures of 20°F ...281°F to assure reliability throughout all application temperature ranges.
- d. Packings: Shall be cartridges suitable for replacement as units withstanding the full operating temperature ranges, including daily and seasonal fluctuations of water, 60% glycol and steam fluids.
- e. Characteristics
  - 1) Rangeability: Two way, 100:1 and greater for stable control under light load.
  - 2) Shutoff, 2-Way: Leakage allowed: ANSI Class IV (0.01% of max flow)
  - 3) 3-Way: Leakage allowed: ANSI Class III (0.1% of max flow)
  - 4) Flow curves: 2-Way modified equal percentage characteristic.
  - 5) Mixing and Diverting: Linear, modified with gradual opening for light loads.
- f. Piping
  - 1) Diverting valves, with the common port at the bottom can be used for mixing.
  - 2) Mixing valves with the common port at the end must not be used for diverting applications.
- g. Sizing
  - 1) Two Position Water: Line size or size using a differential pressure of 1 psi.
  - 2) Modulating Water: 5 PSI or twice the load pressure drop
  - 3) Steam, 2-Way: maximum pressure drop across the valve at a maximum flow of 80 percent of inlet pressure up to 15 psig. Above 15 psig inlet, 42% of absolute (gage pressure + 14.7) inlet pressure.
- h. Certifications for All Models: Pressure Equipment Directive (PED 97/23/EC), RoHS (Restriction of Hazardous Substances) and REACH (Regulation, Evaluation, Authorization, and Restriction of Chemicals)
- i. Basis of Design: Schneider Electric VB-8000 and VB-9000 valves, or approved equal.

Q. Steam Control Valves

1. ½"...2" Steam Service Designed Globe Valve

- a. Body material, and pressure class based on maximum pressure and temperature rating of piping system with a body rating of not less than 400 psig at 150°F, 321 psig at 281°F per ANSI B16.15
- b. High temperature spring-loaded PTFE/EPDM valve stem packing cartridge must be removable for future replacement to restore the valves back to their original condition. Material grade properties must meet the fluid temperature and pressure requirements:
  - 1) Standard duty bronze body, 316 stainless steel vertical stem, brass plug, soft seal, and bronze seat, renewable packing cartridge, and screwed/sweat/flared ends. Valves shall have allowable media temperature of 20°F ...281°F to assure reliability with dual temperature applications.
  - 2) Heavy duty bronze body, 316 stainless steel vertical stem, 316 stainless steel plug, soft seal, and 316 stainless steel seat, renewable packing cartridge, and screwed ends. Valves shall have allowable media temperature of 20°F ...340°F to assure to assure reliability with dual temperature applications.



- 3) High temperature bronze body, 316 stainless steel vertical stem, 316 stainless steel plug, and 316 stainless steel seat, renewable packing cartridge, and screwed ends. Valves shall have allowable media temperature of 20°F ...400°F.
- c. Two-way fluid system globe valves shall have the following characteristics:
  - 1) Rangeability: Greater than 100:1 for all valves with flow coefficients of 0.4 and higher to provide stable control under light load conditions.
  - 2) Maximum Allowable Seat Leakage: Standard and heavy duty valves must be designed to meet ANSI Class V (0.0005 ml per minute per "of orifice diameter per psi differential) up to 35 psi close off differential pressure and ANSI Class IV seat leakage (maximum 0.01% of full open valve capacity) above 35 psi with appropriate actuator. High temperature valves must meet ANSI Class III seat leakage (maximum 0.1% of full open valve capacity).
  - 3) The valve must be able to operate with a full-open operating differential of no less than 87 psi.
  - 4) Flow Characteristics: Modified equal percentage characteristics for standard duty water applications and modified linear for heavy duty and high temperature steam applications with gradual opening for light loads.
  - 5) Sizing:
    - a) Pressure drop across steam valve at a maximum flow of 80 percent of inlet pressure up to 15 psig and 42% of absolute (gage pressure + 14.7) inlet pressure above 15 psig inlet.
    - b) 100 psi saturated steam maximum inlet pressure for heavy duty bronze body globe valves ½"...2".
    - c) 150 psi saturated steam maximum inlet pressure for high temperature bronze body globe valves ½"...2".
    - d) 35 psi saturated steam maximum inlet pressure for standard duty bronze body globe valves ½"...2".
  - 6) Certifications for All Models: Pressure Equipment Directive (PED 97/23/EC), RoHS (Restriction of Hazardous Substances) and REACH (Regulation, Evaluation, Authorization, and Restriction of Chemicals).
  - 7) Basis of Design: Schneider Electric VB-7000 valves, or approved equal.
2. 2-½"...6" Steam Service Designed Globe Valves
  - a. Bodies: Shall be American Factory fabricated with ASTM A 126 Class B cast iron body material with the pressure class within the maximum pressure and temperature rating of the piping system. (125 body rating with not less than 200 psig at 150°F, decreasing to 169 psig at 281°F per ANSA B16.1).
  - b. Serviceability: 2-Way valve operators, stem and plug assemblies and spring-loaded PTFE/EPDM valve stem packing cartridges must be removable for future replacement to restore the valves back to their original condition.
  - c. Construction: Material grades must meet the fluid temperature and pressure requirement temperatures of 20°F ...281°F to assure reliability throughout all application temperature ranges.
  - d. Packings: Shall be cartridges suitable for replacement as units withstanding the full operating temperature ranges, including daily and seasonal fluctuations of water, 60% glycol and steam fluids.
  - e. Characteristics
    - 1) Rangeability: Two way, 100:1 and greater for stable control under light load.
    - 2) Shutoff, 2-Way: Leakage allowed: ANSI Class IV (0.01% of max flow)
    - 3) Flow curves: 2-Way modified equal percentage characteristic.

- f. Sizing
  - 1) Steam, 2-Way: maximum pressure drop across the valve at a maximum flow of 80 percent of inlet pressure up to 15 psig. Above 15 psig inlet, 42% of absolute (gage pressure + 14.7) inlet pressure.
- g. Certifications for All Models: Pressure Equipment Directive (PED 97/23/EC), RoHS (Restriction of Hazardous Substances) and REACH (Regulation, Evaluation, Authorization, and Restriction of Chemicals).
- h. Basis of Design: Schneider Electric VB-8000 and VB-9000 valves, or approved equal.

R. Control Valve Actuators

- 1.  $\frac{1}{2}$ " to  $\frac{3}{4}$ " Ball Valve Actuators
  - a. Size for torque required for valve close-off pressure for system design.
  - b. Coupling: Direct coupled to valve body without use of external devices/tools
  - c. Auxiliary End Switch (optional) to be SPST 24 Vac/Vdc, 101 mA to 5 mA maximum on selected two-position models.
  - d. Controller Signal Two-position, Floating or Proportional (0...5 Vdc, 0...10 Vdc, 5...10 Vdc, or 4...20 mA dc). Design allows for change via DIP switches without removal of cover.
  - e. Manual operating lever and position indicator must be standard.
  - f. Power Requirements: 24 Vac for floating, proportional, and 110...230 Vac for two position multi-voltage types
  - g. Actuators must be available with either Spring Return (SR) or Non-Spring Return (NSR) models.
  - h. Operating Temperature Limit Floating is to be 32...140°F (0...60°C) Proportional 32...140°F (0...60°C) Two-Position 32...169°F (0...76°C)
  - i. Wiring (depending on model) Removable Terminal Block, 10 ft. (3.05 m) Plenum Cable, 18 in. (45 cm) Appliance Wire
  - j. Locations must be rated NEMA 2, IEC IP31. (Indoor Use Only.) Actuators with terminal block or plenum cable leads are plenum rated per UL file number E9429.
  - k. Agency Listings: ISO 9001, cULus, and CE.
  - l. Basis of Design: Schneider Electric VBB/VBS, or approved equal.
- 2.  $\frac{1}{2}$ " to 3" 2-way and  $\frac{1}{2}$ " to 2" 3-way Ball Valves Actuators
  - a. Size for torque required for valve close-off pressure for system design.
  - b. Actuators are to be available in spring return (SR) and non-spring return (NSR) models. Spring Return (SR) actuators are to provide a choice to return direction.
  - c. Actuators are to be available in models for two-position, floating and proportional control.
  - d. All actuator models are to be equipped with pigtail leads, manual override, and auxiliary switch(es)
  - e. Operating temperatures' Floating Non-Spring Return (NSR) with 33 lb.-in. of torque must be -25 to 130 °F (-32 to 55°C). All other actuators are to -22 to 140 °F (-30 to 60 °C)
  - f. Actuators must be NEMA 2 rated.
  - g. Agency Listings: ISO 9001, cULus, and CE.
  - h. Basis of Design: Schneider Electric VB-2000, or approved equal.
- 3.  $\frac{1}{2}$ " to 2" Bronze, Linear Globe Valve Actuators/67 or 78 lbs. force
  - a. Actuator must have bi-color LED status indication for motion indication, auto calibration and alarm notification.
  - b. When the actuator is properly mounted must have a minimum of a NEMA 2 (IP53) rating.

- c. Actuators are to be non-spring return.
  - d. Actuators are to be floating (used for two-position) or proportional models.
  - e. Proportional models will have optional models with a position output signal with field selectable 2...10 Vdc and 0...10 Vdc input signals and selectable input signal direct or reverse acting.
  - f. Actuator must have auto calibration which provides precise control by scaling the input signal to match the exact travel of the valve stem
  - g. Actuators must come in models with Pulse Width Modulated (PWM) with field selectable 0.59 to 2.93 sec and 0.1 to 25.5 sec input signal ranges with a position output signal
  - h. Actuators must have manual override with automatic release.
  - i. Models with position feedback output signal include field selectable 2...10 Vdc or 0...5 Vdc output signal
  - j. Removable wiring screw terminal with ½" conduit opening.
  - k. Actuator operating temperature ranges:
    - 1) When controlling fluid up to 266°F (130°C) = ambient air temperature is to be 23...131°F (-5...55°C)
    - 2) Fluid up to 281°F (138°C) = 23...127°F (-5...53°C)
    - 3) Fluid up to 340°F (171°C) = 23...115°F (-5...46°C)
    - 4) Fluid up to 400°F (204°C) = 23...102°F (-5...39°C)
  - l. Actuator agency Listings: cUL-us LISTED mark, NEMA 2, NEC class 2 FCC part-15 class B, Canadian ICES-003, ESA registered, Plenum rated per UL 20430
  - m. Basis of Design: Schneider Electric MG350V, or approved equal.
4. ½" to 2" Bronze, Linear Globe Valve Actuators/105 lbs. force
- a. Actuators must have Two- Position, Floating, and Proportional models.
  - b. Proportional models will a controller input signal of either a 0...10 Vdc, 2...10 Vdc, 4...20 mAdc, 0...3 Vdc, or 6...9 Vdc. Control function direct/reverse action is switch selectable on most models.
  - c. Actuator force is to be 105 lb. (467 newton) with ½" (13 mm) nominal linear stroke
  - d. Power requirements 24 Vac, 120 Vac or 230 Vac depending on model.
  - e. Actuator housings rated for up to NEMA 2/ IP54.
  - f. Actuator is to have overload protection throughout stroke.
  - g. Actuator Operating temperature -22...140°F (-30...60°C) up to a maximum valve fluid temperature of 366°F (186°C).
  - h. Actuator must automatically set input span to match valve travel.
  - i. Actuator must have manual override to allow positioning of valve and preload.
  - j. Actuator is to be spring return.
  - k. Actuator is to mount directly to valves without separate linkage.
  - l. Actuator agency Listings: UL 873, CUL: UL
  - m. Basis of Design: Schneider Electric SmartX Mx51-7103, or approved equal
5. ½" to 2" Bronze, Linear Globe Valve Actuators/220 lbs. force
- a. Actuators must have Two- Position for a SPST controller, Floating for a SPST controller, and Proportional models will a controller input signal of either a 0...10 Vdc, 2...10 Vdc, 4...20 mAdc, or 6...9 Vdc. Control function direct/reverse action is jumper selectable
  - b. Actuator is to be spring return.
  - c. Actuator will have 220 lb. force (979 newton) with ½" (13 mm) or 1" (25 mm) nominal linear stroke

- d. Feedback on proportional model with 2...10 Vdc (max. 0.5 mA) output signal or to operate up to four like additional slave actuators.
  - e. Actuator operating temperature is 0...140°F (-18...60°C) up to a maximum valve fluid temperature of 281°F (138°C), 0...120°F (-18...49°C) up to a maximum valve fluid temperature of 300°F (149°C), 0...100°F (-18...38°C) up to a maximum valve fluid temperature of 340°F (171°C), 0...90°F (-18...32°C) up to a maximum valve fluid temperature of 366°F (186°C).
  - f. Actuator must automatically set input span to match valve travel
  - g. Actuator is to have a 24 Vac power supply on Two-position and Proportional models and 120 Vac on Two-position models.
  - h. Actuator housings rated for up to NEMA 2/ IP54
  - i. Actuator must have manual override to allow positioning of valve and preload
  - j. Actuator is to mount directly to valves without separate linkage.
  - k. Actuator agency Listings: UL 873, CUL: UL
  - l. Basis of Design: Schneider Electric SmartX Mx51-720x, or approved equal.
6. ½" to 2" Bronze, Linear Globe Valve Actuators with linkage SR
- a. Actuators with 35, 60, 133, or 150 lb.-in of force depending on model.
  - b. Actuator housings rated for up to NEMA 2/ IP54 with a 150 lb.-in. rated a NEMA 4.
  - c. Actuators are to be spring return.
  - d. Actuators are to have Two-position, Floating and Proportional models.
  - e. Actuators must have overload protection throughout rotation.
  - f. Actuator have an optional built-in auxiliary switch to provide for interfacing or signaling on selected models.
  - g. Actuator agency listings: UL-873, C22-2 No.24-83, CUL0
  - h. Basis of Design: Schneider Electric SmartX, or approved equal.
7. ½" to 2" Bronze Body, Linear Globe Valve Actuators with linkage SR & NSR
- a. Actuators are to be either floating SPDT control or proportional control 0...10, 2...10 Vdc or 4...20 mA with a 500-ohm resistor included.
  - b. Actuators are to be direct/reverse with selectable DIP switches.
  - c. Actuators are to have 90 lb. (400N), 180 lb. (800N), or 337 lb. (1500N) of force on Non-Spring Return (NSR) 157 lb. of force on the Spring Return model. Note: Not every actuator is for every valve.
  - d. Actuators are to be powered with 24 Vac or 24 Vdc.
  - e. All Non-Spring Return (NSR) actuators are to be NEMA 2, vertical mount only. Spring Return (SR) actuators are to have NEMA 4 models.
  - f. Actuators must have manual override to allow positioning of the valve.
  - g. Actuators must have selectable valve sequencing and flow curves of either equal percentage or linear.
  - h. Actuators must have feedback.
  - i. Actuators must have internal torque protection throughout stroke.
  - j. Actuator operating temperature is 14...122°F (-10...50°C) for chilled water applications, 14...113°F (-10...45°C) up to a maximum valve fluid temperature of 281°F (138°C), 14...107°F (-10...42°C) up to a maximum valve fluid temperature of 300°F (149°C), 14...100°F (-10...38°C) up to a maximum valve fluid temperature of 340°F (171°C), 14...90°F (-10...32°C) up to a maximum valve fluid temperature of 366°F (186°C).
  - k. Actuator agency listings (North America) UL873, cULus, RCM, CE
  - l. Basis of Design: Schneider Electric Forta M400A-VB, M800A-VB, M900A and M1500x-VB screw mounted on Venta VB7000s, or approved equal.

8. 2 ½" to 6" Cast Iron Flanged Globe Valve Linear Actuators with linkage
  - a. Actuators are to be either floating SPDT control or proportional control 0...10, 2...10 Vdc or 4...20 mA with a 500-ohm resistor included.
  - b. Actuators are to direct/reverse acting with selectable DIP switch.
  - c. Actuators are to have 180 lb. (800N) or 337 lb. (1500N) of force.
  - d. Actuators will need a 24 Vac or Vdc power supply.
  - e. Actuators are to be rated NEMA 2, vertical mount only.
  - f. Actuators must have manual override to allow positioning of the valve.
  - g. Actuators must have selectable valve sequencing and flow curves of either equal percentage to linear. A 2...10 Vac feedback.
  - h. Actuators must have Internal torque protection throughout stroke.
  - i. Actuator operating temperature is 14...122°F (-10...50°C) for chilled water applications, 14...113°F (-10...45°C) up to a maximum valve fluid temperature of 281°F (138°C), 14...107°F (-10...42°C) up to a maximum valve fluid temperature of 300°F (149°C).
  - j. Actuator agency listings (North America) UL873, cULus, RCM, CE
  - k. Basis of Design: Schneider Electric Forta M800A and M1500A, or approved equal.
9. 2-½" to 6" Cast Iron Flanged Globe Valve Actuators/220 lbs. force.
  - a. Actuators must have Two- Position for a SPST controller, Floating for a SPST controller, and Proportional models will a controller input signal of either a 0...10 Vdc, 2...10 Vdc, 4...20 mAdc, or 6...9 Vdc. Control function direct/reverse action is jumper selectable.
  - b. Actuator is to be spring return.
  - c. Actuator will have 220 lb. force (979 newton) with ½" (13 mm) or 1" (25 mm) nominal linear stroke.
  - d. Feedback on proportional model with 2...10 Vdc (max. 0.5 mA) output signal or to operate up to four like additional slave actuators.
  - e. Actuator must automatically set input span to match valve travel.
  - f. Actuator Operating temperature 0...140°F (-18...60°C) up to a maximum valve fluid temperature of 300°F (149°C).
  - g. Actuator is to have a 24 Vac power supply on Two-position and Proportional models and 120 Vac on Two-position models.
  - h. Actuator housings rated for up to NEMA 2/IP54.
  - i. Actuator must have manual override to allow positioning of valve and preload.
  - j. Actuator is to mount directly to vales without separate linkage.
  - k. Actuator agency Listings: UL 873, CUL: UL.
  - l. Basis of Design: Schneider Electric SmartX Mx61-720x or approved equal.
10. 2-½" to 6" Cast Iron Flanged Globe Valve Actuators with linkage SR.
  - a. Actuators with 60, 133, or 150 lb.-in of force depending on model.
  - b. Actuator housings rated for up to NEMA 2/ IP54 with a 150 lb.-in. rated a NEMA 4.
  - c. Actuators are to be spring return.
  - d. Actuators are to have Two-position, Floating and Proportional models.
  - e. Actuators must have overload protection throughout rotation.
  - f. Actuator have an optional built-in auxiliary switch to provide for interfacing or signaling on selected models.

- g. Actuator agency listings: UL-873, C22-2 No.24-83, CUL0.
- h. Basis of Design: Schneider Electric SmartX, or approved equal.
- 11. 2" to 18" 2-Way and 2" to 16" 3-Way Linear Butterfly Valve Actuator with linkage NSR
  - a. The butterfly valve actuators are to be Non-Spring Return (NSR) two-position and proportional taking 0...10 Vdc or 4...20 mA models. All Actuators are to be NEMA 4, manual override (hand wheel) two auxiliary switches, and built-in heater.
  - b. Actuator close-offs and CVs must be appropriate for the valve size in a typical HVAC application.
  - c. Actuators must be available in 24 Vac and 120 Vac models.
  - d. Actuators must have Internal wiring isolation for parallel wiring multiple units that eliminates the risk of feedback from one actuator to another.
  - e. Proportional models must have feedback of 0...10 Vdc or 4...20 mA.
  - f. Actuator operating temperature shall be -40...150°F (-40...60°C).
  - g. Actuator agency listings (North America) UL, CSA and CE
  - h. Basis of Design: Schneider Electric S70, or approved equal.
- 12. 2" to 4" 2-Way and 3-Way Butterfly Valve Actuators SR
  - a. The butterfly valve actuators are to be Spring Return (SR) two-position and proportional taking 2...10 Vdc or 4...20 mA models. All Actuators are to be NEMA 2.
  - b. Actuator close-offs and CVs must be appropriate for the valve size in a typical HVAC application.
  - c. Actuators must be available in 24 Vac models.
  - d. Actuators shall have two SPDT auxiliary switch models.
  - e. Actuators must have [Internal wiring isolation for parallel wiring multiple units that eliminates the risk of feedback from one actuator to another.
  - f. Proportional models must have feedback of 2...10 Vdc or 4...20 mA.
  - g. Actuator operating temperature shall be -22...140°F (-12...60°C).
  - h. Actuator agency listings (North America) UL, CSA and CE
  - i. Basis of Design: Schneider Electric SmartX Mx-41-7153, or approved equal.
- 13. 2" to 6" 2-Way and 3-Way Butterfly Valve Actuators NSR
  - a. The butterfly valve actuators are to be Non-Spring Return (NSR) two-position and proportional taking 0...10 Vdc or 4...20 mA models. All Actuators are to be NEMA 2.
  - b. Actuator close-offs and CVs must be appropriate for the valve size in a typical HVAC application.
  - c. Actuators must be available in 24 Vac models.
  - d. Actuators shall have two SPDT auxiliary switch models.
  - e. Actuators must have [Internal wiring isolation for parallel wiring multiple units that eliminates the risk of feedback from one actuator to another.
  - f. Proportional models must have feedback of 2...10 Vdc or 4...20 mA.
  - g. Actuator operating temperature shall be -4...122°F (-2...50°C).
  - h. Actuator agency listings (North America) UL, CSA and CE
  - i. Basis of Design: Schneider Electric SmartX NR-22xx-5xx or approved equal.

S. Damper Actuators

- 1. Direct-coupled type non-hydraulic designed for minimum 100,000 full-stroke cycles at rated torque.
- 2. Direct-coupled damper actuators must have a five-year warrantee.
- 3. Size for torque required for damper seal at maximum design conditions and valve close-off pressure for system design.

4. Direct-coupled damper actuators should accommodate 3/8", 1/2" 1.05" round or 3/8"...1/2" and 3/4" square damper shafts.
5. Actuator operating temperature minimum requirements: 44, 88 and 133 lb.-in. are -25°F...130°F (-32°C...55°C). The 30, 35, 60, 150 and 300 lb.-in. are -25°...140°F (-30°C... 60 °C). The 270 are -22°...122°F (-30°C... 50 °C).
6. Overload protected electronically throughout rotation except for selected Floating actuators the have a mechanical clutch.
7. Spring Return Actuators: Mechanical fail safe shall incorporate a spring-return mechanism.
8. Non-Spring Return Actuators shall stay in the position last commanded by the controller with an external manual gear release to allow positioning when not powered.
9. Power Requirements: 24Vac/dc [120Vac][230Vac]
10. Proportional Actuators controller input range from 0...10 Vdc, 2...10 Vdc or 4...20 mA models.
11. Housing: Minimum requirement NEMA type 2 with NEMA type 4 available for applications requiring higher ratings.
12. Actuators with a microprocessor should not be able to be modified by an outside source (cracked or hacked).
13. Actuators of 133 and 270 lb.-in. of torque or more should be able to be tandem mount or "gang" mount.
14. Agency Listings: ISO 9001, cULus, CE and CSA
15. Basis of Design: Schneider Electric SmartX Actuators, or approved equal.

T. Smoke Detectors

1. Air duct smoke detectors shall be by Air Products & Controls or approved equal. The detectors shall operate at air velocities from 300 feet per minute to 4000 feet per minute.
2. The smoke detector shall utilize a photoelectric detector head.
3. The housing shall permit mechanical installation without removal of the detector cover.
4. The detectors shall be listed by Underwriters Laboratories and meet the requirements of UL 268A.

U. Airflow Measuring Stations

1. Provide a thermal anemometer using instrument grade self heated thermistor sensors with thermistor temperature sensors.
2. The flow station shall operate over a range of 0 to 5,000 feet/min with an accuracy of +/- 2% over 500 feet/min and +/- 10 ft/min for reading less than 500 feet/min.

## 2.8 ELECTRICAL POWER MEASUREMENT

A. Electrical Power Monitors, Single Point (Easy Install):

1. General: Consist of three split-core CTs, factory calibrated as a system, hinged at both axes with the electronics embedded inside the master CT. The transducer shall measure true (rms.RMS) power demand real power (kW) consumption (kWh). Conform to ANSI C12.1 metering accuracy standards.
2. Voltage Input: Load capacity as shown on drawings. 208-480 VAC, 60 Hz
3. Maximum Current Input: Up to 2400A
4. Performance:
  - a. Accuracy: +/- 1% system from 10% to 100% of the rated current of the CT's
  - b. Operating Temperature Range: 32-140°F, 122°F for 2400A.
5. Output: 4 to 20 mA, Pulse. or Modbus RTU
6. Ratings:
  - a. Agency: UL508 or equivalent

- b. Transducer internally isolated to 2000 VAC.
    - c. Case isolation shall be 600 VAC.
  - 7. Basis of Design: Similar to Enercept H80xx Series, E23 Series
  - 8. Accessories: Current transducers (CTs): split-core (E681/H681/U004) series, solid-core (E682/U004 series) and Rogowski Coils – rope style (E683 series); Communications gateways: Modbus to Ethernet (EGX150)
- B. Electrical Power Monitors, Single Point (High Accuracy):
  - 1. General: Revenue grade meter. Measures voltage, amperage, real power (kW), consumption (kWh), and reactive power (kVARar), and power factor (PF) per phase and total load for a single load. Factory calibrated as a system using split core CT's. Neutral voltage connection is required.
  - 2. Voltage Input: 208-480 VAC, 60 Hz
  - 3. Current Input: Up to 2400A
  - 4. Performance:
    - a. Accuracy: +/- 1% system from 2% to 100% of the rated current of the CT's
    - b. Operating Temperature Range: 32-122°F
  - 5. Output: Pulse, BACnet, Modbus RTU
  - 6. Display: Backlit LCD
  - 7. Enclosure: NEMA 1
  - 8. Agency Rating: UL508 or equivalent
  - 9. Basis of Design: Veris Industries H81xx00 series.
  - 10. Accessories: Current transducers (CTs): split-core (E681/H681/U004) series, solid-core (E682/U004 series)
- C. Electrical Power Monitors, Single Point (High Accuracy/Versatility):
  - 1. General: Revenue grade meter. Measures voltage, amperage, real power (kW), consumption (kWh), reactive power (kVAR), apparent power (kVA) and power factor (PF) per phase and total load for a single load. Available with data logging , Bi-directional (4-quadrant) metering, and pulse contact accumulator inputs.
  - 2. Voltage Input: 90-600 VAC, 50/60 Hz, 125-300 VDC
  - 3. Current Input: 5A – 32,000A, selectable 1/3V or 1V CT inputs
  - 4. Performance:
    - a. Accuracy shall be +/- [0.2%][0.5%] revenue grade
    - b. Operating Temperature Range: -22-158°F
  - 5. Output shall be [Pulse][BACnet][Modbus RTU][LON][Modbus TCP][BACnet/IP][Modbus RTU/TCP][SNMP]
  - 6. Display: Backlit LCD
  - 7. Enclosure: NEMA 4x optional
  - 8. Agency Rating: UL508, ANSI C12.20
  - 9. Basis of Design: Veris E50 series, Veris E60 Series or Schneider Electric PM5000 Series
  - 10. Accessories: Current transducers (CTs): split-core (E681/H681/U004) series, solid-core (E682/U004 series) and Rogowski Coils – rope style (E683 series)
- D. Electrical Power Monitors, Multiple Point (92 loads, High Accuracy):
  - 1. General: Revenue grade meter. Measures volts, amps, power and energy for each circuit. 1/4 amp to 200 amp monitoring. 4 configurable alarm threshold registers
  - 2. Voltage Input: 90-277 VAC, 60 Hz
  - 3. Current Input: 5A – 32,000A, 1/3V CT inputs



4. Performance:
  - a. Accuracy: +/- 0.5% meter (split core), +/- 1% system from 1/4-100A (solid core)
  - b. Operating Temperature Range: 32-140°F
5. Output: [BACnet][Modbus RTU][ModbusTCP][BACnet/IP][Modbus RTU/TCP][SNMP]
6. Agency Rating: UL508, ANSI C12.10, IEC Class 1
7. Basis of Design: Veris E3xxx series.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Examine equipment exterior and interior prior to installation. Report any damage and do not install any equipment that is structurally, moisture, or mildew damaged.
- B. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Engineer, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
- C. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installer.
- D. Install equipment in accordance with reviewed product data, final shop drawings, manufacturer's written instructions and recommendations, and as indicated on the Drawings.
- E. Provide final protection and maintain conditions in a manner acceptable to the manufacturer that shall help ensure that the equipment is without damage at time of Substantial Completion.
- F. Demolition
  1. Remove controls which do not remain as part of the building automation system, all associated abandoned wiring and conduit, and all associated pneumatic tubing. The Owner will inform the Contractor of any equipment which is to be removed that will remain the property of the Owner. All other equipment which is removed will be disposed of by the Contractor.
- G. Access to Site
  1. Unless notified otherwise, entrance to building is restricted. No one will be permitted to enter the building unless their names have been cleared with the Owner or the Owner's Representative.
- H. Code Compliance
  1. All wiring shall be installed in accordance with all applicable electrical codes and will comply with equipment manufacturer's recommendations. Should any discrepancy be found between wiring specifications in Division 17 and Division 16, wiring requirements of Division 17 will prevail for work specified in Division 17.
- I. Cleanup
  1. At the completion of the work, all equipment pertinent to this contract shall be checked and thoroughly cleaned, and all other areas shall be cleaned around equipment provided under this contract.

### 3.2 SYSTEM ACCEPTANCE TESTING

- A. All application software will be verified and compared against the sequences of operation.

- B. Control loops will be exercised by inducing a setpoint shift of at least 10% and observing whether the system successfully returns the process variable to setpoint. Record all test results and attach to the Test Results Sheet.
- C. Test each alarm in the system and validate that the system generates the appropriate alarm message, that the message appears at all prescribed destinations (workstations or printers), and that any other related actions occur as defined (i.e. graphic panels are invoked, reports are generated, etc.). Submit a Test Results Sheet to the owner.
- D. Perform an operational test of each unique graphic display and report to verify that the item exists, that the appearance and content are correct, and that any special features work as intended. Submit a Test Results Sheet to the owner.
- E. Perform an operational test of each third party interface that has been included as part of the automation system. Verify that all points are properly polled, that alarms have been configured, and that any associated graphics and reports have been completed. If the interface involves a file transfer over Ethernet, test any logic that controls the transmission of the file, and verify the content of the specified information.

### 3.3 INSTALLATION

- A. Hardware Installation Practices for Wiring
  - 1. All controllers are to be mounted vertically and per the manufacturer's installation documentation.
  - 2. The 120VAC power wiring to each Ethernet or Remote Site controller shall be a dedicated run, with a separate breaker. Each run will include a separate hot, neutral and ground wire. The ground wire will terminate at the breaker panel ground. This circuit will not feed any other circuit or device.
  - 3. A true earth ground must be available in the building. Do not use a corroded or galvanized pipe, or structural steel.
  - 4. Wires are to be attached to the building proper at regular intervals such that wiring does not droop. Wires are not to be affixed to or supported by pipes, conduit, etc.
  - 5. Conduit in finished areas will be concealed in ceiling cavity spaces, plenums, furred spaces and wall construction. Exception; metallic surface raceway may be used in finished areas on masonry walls. All surface raceway in finished areas must be color matched to the existing finish within the limitations of standard manufactured colors.
  - 6. Conduit, in non-finished areas where possible, will be concealed in ceiling cavity spaces, plenums, furred spaces, and wall construction. Exposed conduit will run parallel to or at right angles to the building structure.
  - 7. Wires are to be kept a minimum of three (3) inches from hot water, steam, or condensate piping.
  - 8. Where sensor wires leave the conduit system, they are to be protected by a plastic insert.
  - 9. Wire will not be allowed to run across telephone equipment areas.
  - 10. Provide fire caulking at all rated penetrations.
- B. Installation Practices for Field Devices
  - 1. Well-mounted sensors will include thermal conducting compound within the well to insure good heat transfer to the sensor.
  - 2. Actuators will be firmly mounted to give positive movement and linkage will be adjusted to give smooth continuous movement throughout 100 percent of the stroke.
  - 3. Relay outputs will include transient suppression across all coils. Suppression devices shall limit transients to 150% of the rated coil voltage.
  - 4. Water line mounted sensors shall be removable without shutting down the system in which they are installed.

5. For duct static pressure sensors, the high pressure port shall be connected to a metal static pressure probe inserted into the duct pointing upstream. The low pressure port shall be left open to the plenum area at the point that the high pressure port is tapped into the ductwork.
6. For building static pressure sensors, the high pressure port shall be inserted into the space via a metal tube. Pipe the low pressure port to the outside of the building.

C. Wiring, Conduit, and Cable

1. All wire will be copper and meet the minimum wire size and insulation class listed below:
  - a. Power - 12 Gauge - 600 Volt
  - b. Class One - 14 Gauge Std. - 600 Volt
  - c. Class Two - 18 Gauge Std. - 300 Volt
  - d. Class Three - 18 Gauge Std. - 300 Volt
  - e. Communications - Per Mfr.
2. Power and Class One wiring may be run in the same conduit. Class Two and Three wiring and communications wiring may be run in the same conduit.
3. Where different wiring classes terminate within the same enclosure, maintain clearances and install barriers per the National Electric Code.
4. Where wiring is required to be installed in conduit, EMT shall be used. Conduit shall be minimum 1/2 inch galvanized EMT. Set screw fittings are acceptable for dry interior locations. Watertight compression fittings shall be used for exterior locations and interior locations subject to moisture. Provide conduit seal-off fitting where exterior conduits enter the building or between areas of high temperature/moisture differential.
5. Flexible metallic conduit (max. 3 feet) shall be used for connections to motors, actuators, controllers, and sensors mounted on vibration producing equipment. Liquid-tight flexible conduit shall be use in exterior locations and interior locations subject to moisture.
6. Junction boxes shall be provided at all cable splices, equipment termination, and transitions from EMT to flexible conduit. Interior dry location J-boxes shall be galvanized pressed steel, nominal four-inch square with blank cover. Exterior and damp location JH-boxes shall be cast alloy FS boxes with threaded hubs and gasketed covers.
7. Where the space above the ceiling is a supply or return air plenum, the wiring shall be plenum rated. Teflon wiring can be run without conduit above suspended ceilings. EXCEPTION: Any wire run in suspended ceilings that is used to control outside air dampers or to connect the system to the fire management system shall be in conduit.
8. Fiber optic cable shall include the following sizes; 50/125, 62.5/125 or 100/140.
9. Only glass fiber is acceptable, no plastic.
10. Fiber optic cable shall only be installed and terminated by an experienced contractor. The BAS system supplier shall submit to the Engineer the name of the intended contractor of the fiber optic cable with his submittal documents.

D. Enclosures

1. For all I/O requiring field interface devices, these devices where practical will be mounted in a field interface panel (FIP). The Contractor shall provide an enclosure which protects the device(s) from dust, moisture, conceals integral wiring and moving parts.
2. FIPs shall contain power supplies for sensors, interface relays and contactors, and safety circuits.
3. The FIP enclosure shall be of steel construction with baked enamel finish; NEMA 1 rated with a hinged door and keyed lock. The enclosure will be sized for twenty percent spare mounting space. All locks will be keyed identically.
4. All wiring to and from the FIP will be to screw type terminals. Analog or communications wiring may use the FIP as a raceway without terminating. The use of wire nuts within the FIP is prohibited.
5. All outside mounted enclosures shall meet the NEMA-4 rating.

6. The wiring within all enclosures shall be run in plastic track. Wiring within controllers shall be wrapped and secured.

E. Identification

1. Identify all control wires with labeling tape or sleeves using words, letters, or numbers that can be exactly cross-referenced with as-built drawings.
2. All field enclosures, other than controllers, shall be identified with a Bakelite nameplate. The lettering shall be in white against a black or blue background.
3. Junction box covers will be marked to indicate that they are a part of the BAS system.
4. All I/O field devices (except space sensors) that are not mounted within FIP's shall be identified with name plates.
5. All I/O field devices inside FIP's shall be labeled.

F. Existing Controls.

1. Existing controls which are to be reused must each be tested and calibrated for proper operation. Existing controls which are to be reused and are found to be defective requiring replacement, will be noted to the Owner. The Owner will be responsible for all material and labor costs associated with their replacement or repair.

G. Location

1. The location of sensors is per mechanical and architectural drawings.
2. Space humidity or temperature sensors will be mounted away from machinery generating heat, direct light and diffuser air streams.
3. Outdoor air sensors will be mounted on the north building face directly in the outside air. Install these sensors such that the effects of heat radiated from the building or sunlight is minimized.
4. Field enclosures shall be located immediately adjacent to the controller panel(s) to which it is being interfaced.

H. Software Installation

1. The Contractor shall provide all labor necessary to install, initialize, start-up and debug all system software as described in this section. This includes any operating system software or other third party software necessary for successful operation of the system.

### 3.4 TRAINING

- A. The BAS system supplier shall provide both on-site and classroom training to the Owner's representative and maintenance personnel per the following description:
- B. On-site training shall consist of a minimum of (8) hours of hands-on instruction geared at the operation and maintenance of the systems. The curriculum shall include
  1. System Overview
  2. System Software and Operation
  3. System access
  4. Software features overview
  5. Changing setpoints and other attributes
  6. Scheduling
  7. Editing programmed variables
  8. Displaying color graphics
  9. Running reports
  10. Workstation maintenance

11. Viewing application programming
12. Operational sequences including start-up, shutdown, adjusting and balancing.
13. Equipment maintenance

### **3.5 CONTROL SYSTEM SWITCH-OVER**

- A. Demolition of the existing control system will occur after the new temperature control system is in place including new sensors and new field interface devices.
- B. Switch-over from the existing control system to the new system will be fully coordinated with the Owner. A representative of the Owner will be on site during switch-over.
- C. The Contractor shall minimize control system downtime during switch-over. Sufficient installation mechanics will be on site so that the entire switch-over can be accomplished in a reasonable time frame.

### **3.6 DATABASE CONFIGURATION.**

- A. The Contractor will provide all labor to configure those portions of the database that are required by the points list and sequence of operation.

### **3.7 COLOR GRAPHIC DISPLAYS.**

- A. Unless otherwise directed by the owner, the Contractor will provide color graphic displays as depicted in the mechanical drawings for each system and floor plan. For each system or floor plan, the display shall contain the associated points identified in the point list and allow for setpoint changes as required by the owner.

### **3.8 REPORTS.**

- A. The Contractor will configure a minimum of 4 reports for the owner. These reports shall, at a minimum, be able to provide:
  1. Trend comparison data
  2. Alarm status and prevalence information
  3. Energy Consumption data
  4. System user data

### **3.9 POINT TO POINT CHECKOUT.**

- A. Each I/O device (both field mounted as well as those located in FIPs) shall be inspected and verified for proper installation and functionality. A checkout sheet itemizing each device shall be filled out, dated and approved by the Project Manager for submission to the owner or owner's representative.
- B. In case of wireless devices, the signal strength recorded during checkout shall be reported.

### **3.10 CONTROLLER AND WORKSTATION CHECKOUT.**

- A. A field checkout of all controllers and front end equipment (computers, printers, modems, etc.) shall be conducted to verify proper operation of both hardware and software. A checkout sheet itemizing each device and a description of the associated tests shall be prepared and submitted to the owner or owner's representative by the completion of the project.

### **3.11 DOCUMENTATION**

- A. As built software documentation will include the following:

1. Descriptive point lists
2. Application program listing
3. Application programs with comments.
4. Printouts of all reports.
5. Alarm list.
6. Printouts of all graphics
7. Commissioning and System Startup
8. An electronic copy of all databases, configuration files, or any type of files created specifically for each system.

END OF SECTION 23 09 23

## BOILER WATER CONTROL

- A. Alarms:
  - 1. B-1 through 4 General Alarm.
  - 2. Low Return Water Temperature.
  - 3. Low system differential pressure.
  
- B. Manual Control and Indication:
  - 1. B-1 through 4 H-O-A Control.
  - 2. B-1 through 4 On-Off Indication.
  - 3. Main hydronic loop HGR temperature indication.
  - 4. Main hydronic loop HGS temperature indication.
  - 5. CP-F3, CP-F4, CP-F8, CP-F9 H-O-A Control.
  - 6. CP-F3, CP-F4, CP-F8, CP-F9 On-Off Indication.
  - 7. Outdoor temperature reset adjustment.
  - 8. B-1 thru B-4 Boiler Firing Rate Control.
  - 9. B-1, B-2 and B-3, B-4 Boiler lead/lag selection.
  - 10. B-1, B-2 and B-3, B-4 lead/lag alternator setting (hours of use).
  - 11. B-1 through 4 totalized run time.
  - 12. Alarm setpoints.
  
- C. Automated Control:
  - 1. Hydronic Loop Temperature: Boilers shall be enabled/disabled by the DDC system to maintain the hydronic loop temperature setpoint. Start, stop and modulate the burner firing rate to maintain the main hydronic loop temperature downstream of all the boilers. Boiler controls for cast iron oil/gas burning boilers B-3 and B-4 shall automatically perform prepurge and postpurge as part of start up and shut down sequencing. Boiler shut down for all boilers shall occur in an orderly fashion with return to low fire prior to shut down. Control of burner firing rate shall operate on rate of rise control, energizing low fire first and, after timed delay, modulating to meet demand. The Aerco boilers (B-1 & B-2) shall start on low fire and modulate to full fire before the cast iron boilers are allowed to fire. Initially the lead Aerco boiler shall start on low fire and modulate to meet loop demand. Once the boiler reaches 100% of firing rate, and after a time delay, cannot meet demand the second Aerco boiler shall be started at low fire and the lead Aerco boilers shall modulate down to low fire. Both boilers shall then be modulated in parallel up to high fire as needed to meet the loop demand. If both Boilers B-1 and B-2 are at full fire, and after time delay, the hydronic loop desired temperature setpoint cannot be met the lead Cast Iron Boiler, B-3 or B-4 shall start. As lead Cast Iron Boiler starts, lag Aerco Boiler, B-1 or B-2 shall ramp down and shutoff. The lead Cast Iron Boiler shall run at low fire while Lead Aerco Boiler modulates to maintain setpoint. Once the boiler reaches 100% of firing rate, and after a time delay, cannot meet demand the second Aerco boiler shall be started at low fire and the lead Aerco boilers shall modulate down to low fire. Both boilers shall then be modulated in parallel up to high fire as needed to meet the loop demand. If after time delay the setpoint cannot be met the lead then the lead Cast Iron Boiler shall modulate up to full capacity to maintain setpoint.
  - 2. Boiler Circulation Pump Operation: Boiler circulation pump CP-F3, CP-F4, CP-F8 or CP-F9 shall start running whenever there is a call to run for the respective Boiler. CP-F3 and CP-F4 shall run for 30 minutes after respective Boiler B-3 or B-4 shuts off. CP-F8 and CP-F9 shall operate for 10 minutes after respective Boiler B-1 or B-2 shuts off.
  - 3. Alternator: Under normal operation rotate boiler operation between B-1 and B-2, to equalize each boiler's run time. Rotation time initially set at 200 hours, adjustable. Under

times of high demand rotate cast iron boiler on and rotate between B-3 and B-4 to equalize run time.

4. Under emergency operation, loss of natural gas service, boilers B-3 and B-4 will alternate lead/lag, to equalize each boiler's run time. Programming shall include the primary loop rate of rise when determining the individual boiler firing rate. The lead boiler shall operate to maintain the primary heating water temperature. Rate of rise shall be used to determine an increase in the firing rate. If the lead boiler reaches 100% firing capacity and cannot maintain the loop temperature after a 15 minute (adjustable) time delay, start the next boiler in sequence. When the loop temperature is satisfied and the heating demand is reduced the boilers can be sequentially shut down. The last boiler(s) brought on line shall be the first to shut down. The burner shall modulate to low fire and perform an orderly shut down in sequence.
5. Boiler B-3, B-4 Standby boiler temperature: The Boiler Circulation pump shall operate to maintain the boiler at 120 degrees F (adjustable).

### 3.2 HYDRONIC HEATING PUMP (CP-F1, CP-F2)

- A. Alarms:
  1. No flow.
  2. Integral VFD alarms.
- B. Manual Control and Indication:
  1. CP-F1 and CP-F2 H-O-A Control.
  2. CP-F1 and CP-F2 On-Off Indication.
  3. Lead pump selector.
  4. Alternator setting (hours of use).
  5. Hydronic system differential pressure.
  6. Hydronic system differential pressure setpoint adjustment.
  7. VFD status.
  8. VFD output signal.
- C. Automated Control:
  1. Upon failure of the lead pump, delay 30 seconds (adjustable), signal alarm and the lag pump shall start.
  2. Wire controls to prevent both pumps from operating simultaneously.
  3. Alternator: Lead/lag pump operation shall check pump runtime every week and alternate pumps to equalize runtime.
  4. The heating system sensor located in the Denali Fan room shall modulate the variable frequency drives to maintain system pressure.

### 3.3 PATIENT WING LOW TEMPERATURE HEATING SYSTEMS

- A. Alarms:
  1. Low discharge temperature.
  2. High discharge temperature.
  3. No flow.
- B. Manual Control and Indication:
  1. CP-X (Primary and Stand-by) H-O-A control.
  2. CP-X (Primary and Stand-by) On-Off Indication.
  3. GHS supply temperature.
  4. GHR return temperature.
  5. Lead pump selector.



6. Pump hours of operation indication.
7. Alternator setting (hours of use).
8. Outdoor temperature reset adjustment.
9. Alarm setpoints.

C. Automated Control:

1. Three-way modulating valve shall maintain glycol discharge temperature of 110 F (adjustable).
2. Pump shall run continuously. Upon no flow condition, delay 30 seconds then signal alarm, and start stand-by pump. Wire controls to prevent both pumps from operating at the same time.

### 3.4 SNOW MELT SYSTEMS

A. Alarms:

1. Pump flow failure.
2. Low discharge temperature, 10 F off of setpoint (adjustable).

B. Manual Control and Indication:

1. CP-X H-O-A Control.
2. CP-X On-Off Indication.
3. Pump hours of operation indication.
4. Ambient temperature.
5. Snow sensor status.
6. Snow Melt Loop supply temperature setpoint.
7. Snow Melt Loop supply temperature indication.
8. Alarm setpoints.

C. Automated Control:

1. Locate snow sensor in walkway at front entry to east of canopy in walkway to accessible parking.
2. During winter months when ambient air temperature is below 35° F (adjustable) the pump shall operate continuously. When ambient air is above setpoint pump shall be off.
3. When the snow sensor indicates there is no snow the system shall be in 'idle' mode. The three way control valve shall modulate as required to maintain 35° F (adjustable) supply temperature to the snow melt loops.
4. When the snow sensor indicates there is snow present the system shall modulate the three way control valve as required to maintain 130° F (adjustable) supply temperature to the snow melt loops. Setpoint shall ramp up from 35° F to 130° F at a rate of 3 degrees per minute.
5. Upon failure of the pump, delay one minute then signal alarm.

### 3.5 GLYCOL FEED PUMPS

A. Alarms:

1. None.

B. Manual Control and Indication:

1. Pressure Gauge.

C. Automated Control:

1. Integral pressure control starts/stops pump to maintain system pressure, initially set at 18 psig.

## 3.6 CHILLED WATER SYSTEM

- A. Direct Digital Control: Chiller system will be enabled and disabled by the Direct Digital Controls System specified under Section 15900 as follows:
  - 1. Outdoor air temperature (initially set at 50° F, adjustable).
- B. DDC Interface: Alarms, manual control points and indication points as outlined below will be integrated into the Direct Digital Controls system (as specified under 15975) for system monitoring and control. Coordinate with Section 15682 for control panel requirements.
- C. Manufacturer's Control Panel: Direct control of chilled water system will be by micro-processor based panel and/or combination of panels provided by the chiller equipment manufacturer.
- D. Alarms:
  - 1. CH-1 and 2 High refrigerant (condenser) pressure.
  - 2. CH-1 and 2 Low refrigerant (evaporator) temperature.
  - 3. CH-1 and 2 Low refrigerant (evaporator) pressure.
  - 4. CH-1 and 2 Run Load Amps.
  - 5. CH-1 and 2 Low line voltage.
  - 6. CH-1 and 2 Evaporator water flow.
- E. Manual Control and Indication:
  - 1. CH-1 and 2 H-O-A switch.
  - 2. CH-1 and 2 Lead-lag selector switch.
  - 3. CH-1 and 2 On-Off indication.
  - 4. CH-1 and 2 Evaporator refrigerant pressure.
  - 5. CH-1 and 2 Evaporator refrigerant temperature.
  - 6. CH-1 and 2 Compressor status.
  - 7. CH-1 and 2 Evaporator glycol entering temperature.
  - 8. CH-1 and 2 Evaporator glycol leaving temperature.
  - 9. CH-1 and 2 Motor driven elapsed run time meter.
  - 10. CH-1 and 2 Condenser fans % running.
  - 11. CH-1 and 2 Hours of operation indication.
  - 12. CH-1 and 2 Alternator setting (hours of use).
  - 13. CH-1 and 2 Communications status.
  - 14. CP-D5 and 6 H-O-A Control.
  - 15. CP-D5 and 6 On-Off Indication.
  - 16. Lead pump selector.
  - 17. Pump hours of operation indication.
  - 18. Pump alternator setting (hours of use).
  - 19. Main CGS loop temperature indication.
  - 20. Main CGR loop temperature indication.
  - 21. Chilled glycol temperature setpoint.
  - 22. Chilled glycol temperature limit setpoint.
  - 23. System pressure indication.
  - 24. Chilled glycol system pressure.
  - 25. Chilled glycol system pressure setpoint adjustment.
  - 26. Alarm setpoints.
- F. Automated Control:
  - 1. Chiller Operation: Chiller system will be enabled/disabled by the Direct Digital Controls system specified under Section 15900 as outlined within this section.
  - 2. Chiller Sequencing: The chiller will start and stop system water pumps and chillers based upon the loading of the operating chillers.

- a. Lead Chiller: When the chilled water system is enabled the chiller system control will open chiller two-way control valve, start evaporator and condenser water pumps and prove flow of each; start the lead chiller after flow is proven.
- b. Lag Chillers: If the lead chiller's current draw exceeds a user definable setting, the lag chiller will start. The length of time the chiller load must remain above the load setting will vary depending upon CWS temperature deviation from setpoint. Lead chillers start in a similar manner to the lead chiller. Operating chillers will unload prior to starting a lag chiller to prevent system interruptance caused by lag chiller's pumps. Each chiller's setpoint will be varied to equalize the chiller loading and meet system demands as the system load varies. When the system current draw drops below a user definable setting, the lag chiller will shut down. Lag chiller pumps will not shutdown until the lag chiller's compressor is proven off.
3. Chiller Failure: Upon sensing a failure, the failed chiller and pumps will be disabled, chiller two way control valve shall close, and the next chiller in the rotation sequence will start.
4. Chiller Alternator: Rotate chiller operation to equalize each chiller's run time. Rotation time adjustable.
5. The lead pump shall operate when chiller system is enabled, pumps shall be off otherwise.
6. Chiller Glycol Pumps: The chillers require a minimum flow of 150 gpm per chiller. The lead chilled glycol pump speed will be set to a minimum speed to maintain minimum flow in the bypass loop. When the chilled glycol system is activated the normally open chilled glycol bypass valve shall modulate to maintain to a minimum differential pressure at the farthest coil while maintaining the minimum flow rate. When the bypass valve is fully closed the VFD will then increase the pump speed to maintain minimum differential pressure as sensed in the Denali Fan Room.
7. Upon failure of the lead pump, the lag pump shall operate.
8. Alternator: Lead/lag pump operation shall check pump runtime every week and alternate pumps to equalize runtime.

### 3.7 DOMESTIC HOT WATER GENERATORS

- A. Alarms:
  1. High limit temperature on patient wings 120 Deg F (Adjustable, near tank after mixing valve).
- B. Manual Control and Indication:
  1. Integral controls, on the generator, shall display domestic hot water setpoint.
  2. Domestic HW supply temperature indication.
  3. Alarm setpoints.
- C. Automated Control:
  1. Integral control aquastat will open 2-way control valve to maintain tank water setpoint initially set at 140 F.
  2. Self-contained mixing valve controls the hot water temperature supplied to the patient wings at 110 F.

### 3.8 DOMESTIC HW CIRCULATING PUMPS – PATIENT WINGS

- A. Alarms:
  1. High HW temperature on patient wings (after mixing valve).
- B. Manual Control and Indication:
  1. CP-X H-O-A Control.

- C. Automated Control:
  - 1. Pumps shall run continuously unless the hot water recirculation temperature (HWC) rises above 115 deg F. Upon sensing a HWC temperature above 115 deg F. the pump will shutoff. The pump will restart when the HWC temperature falls to below 105 deg F.

### 3.9 DOMESTIC HW CIRCULATING PUMPS – KITCHEN AND ADMIN.

- A. Alarms:
  - 1. None
- B. Manual Control and Indication:
  - 1. CP-X H-O-A Control.
- C. Automated Control:
  - 1. Kitchen 140 degree loop and West Admin. Area: Pumps shall run continuously.
  - 2. Kitchen 120 degree loop and East Admin. Area: Pumps shall run continuously unless the hot water recirculation temperature (HWC) rises above 125 deg F. Upon sensing a HWC temperature above 125 deg F. the pump will shutoff. The pump will restart when the HWC temperature falls to below 115 deg F.

### 3.10 AIR HANDLING UNIT (Non Patient Wing)

- A. Alarms:
  - 1. Low S/A air temperature (50° F adjustable).
  - 2. Filter Bank high differential pressure.
  - 3. Smoke detection.
  - 4. No Flow.
- B. Manual Control and Indication:
  - 1. H-O-A control.
  - 2. On-off indication.
  - 3. Outside temperature reset adjustment.
  - 4. S/A temperature setpoint.
  - 5. S/A temperature indication.
  - 6. M/A temperature indication.
  - 7. O/A temperature indication.
  - 8. O/A minimum position adjustment.
  - 9. Pre-filter differential pressure.
  - 10. Medium efficiency filter differential pressure.
  - 11. Morning warmup S/A setpoint.
  - 12. Morning warmup R/A setpoint.
  - 13. Duct static pressure setpoint.
  - 14. Alarm setpoints.
- C. Automated Control:
  - 1. Operation Mode: Day and night mode of operation will be controlled by a seven (7) day time clock. Admin fan AHU-A2 and AHU-G1 will run 24/7.
  - 2. Day mode operation:
    - a. During operation a minimum positioner will maintain O/A dampers at 20% minimum position (initial setting, adjustable).
    - b. The S/A desired temperature shall be initially set at 55° F (adjustable). The system shall monitor all zones served by the air handler and when all the zones are

adequately cooled the system shall reset the supply air temperature up until the warmest zone is adequately cooled with it's VAV box open to 100%.

- c. The S/A air temperature sensor will modulate the O/A dampers, R/A dampers, heating coil control valve, and cooling coil control valve to maintain S/A temperature setpoint as follows:

O/A temp.	O/A damper	Cooling Coil
Below 55° F	Modulates	Closed
55° F - R/A temp	Modulates to full open	Modulates
Above R/A temp	Min. position	Modulates

- d. VFD Supply Fan: Duct static pressure sensor, two-thirds of the way down the supply duct system, will modulate the variable speed drive to maintain setpoint.
- e. VFD Return Fan: Duct static pressure sensor in the return fan suction plenum will modulate the variable speed drive to maintain set.
- f. On low supply air temperature alarm (initially 40° F, adjustable), delay two minutes, then O/A dampers will fully close, R/A dampers will fully open, and an alarm shall signal. Provide automatic reset of alarm after five minutes.
- g. On smoke detection, the fan shall stop, O/A dampers will fully close, R/A dampers will fully open, heating valve control valve will modulate to satisfy S/A temperature sensor. Interconnect with fire alarm system such that upon smoke indication fire alarm system shall be signaled and conversely upon activation of the fire alarm system shall stop the fan as indicated above. Coordinate with Section 16721.

### 3.11 AIR HANDLING UNIT (Gymnasium)

#### A. Alarms:

1. Low S/A air temperature (50° F adjustable).
2. Filter Bank high differential pressure.
3. Smoke detection.
4. No Flow.

#### B. Manual Control and Indication:

1. H-O-A control.
2. On-off indication.
3. S/A temperature setpoint.
4. S/A temperature indication.
5. M/A temperature indication.
6. O/A temperature indication.
7. O/A minimum position adjustment.
8. Pre-filter differential pressure.
9. Medium efficiency filter differential pressure.
10. Morning warmup S/A setpoint.
11. Morning warmup R/A setpoint.
12. Alarm setpoints.

#### C. Automated Control:

1. Operation Mode: Day and night mode of operation will be controlled by a seven (7) day time clock.
2. Night mode operation: During night mode of operation the fan shall cycle on/off with the heating coil 100% open to maintain the gym night set point of 60° F (adjustable), O/A damper shall be fully closed, R/A damper fully open. When the unit is off the heating coil will modulate to maintain S/A sensor setpoint except under freeze alarm as defined below.

3. Morning Warmup: At the beginning of day mode, fan starts on 100% R/A. Heating coil modulates to 100% open. When gym temperature rises to 68° F (adjustable) the system will switch to day mode operation.
4. Day mode operation:
  - a. During operation a minimum positioner will maintain O/A dampers at 20% minimum position (initial setting, adjustable).
  - b. The S/A air temperature sensor will modulate the O/A dampers, R/A dampers, heating coil control valve, and cooling coil control valve to maintain the gym day set point temperature (initially 68° F, adjustable) as follows:

O/A temp.	O/A damper	Cooling Coil
Below 55° F	Modulates	Closed
55° F - R/A temp	Modulates to full open	Modulates
Above R/A temp	Min. position	Modulates

- c. On low supply air temperature alarm (initially 40° F, adjustable), delay two minutes, then O/A dampers will fully close, R/A dampers will fully open, and an alarm shall signal. Provide automatic reset of alarm after five minutes.
- d. On smoke detection, the fan shall stop, O/A dampers will fully close, R/A dampers will fully open, heating valve control valve will modulate to satisfy S/A temperature sensor. Interconnect with fire alarm system such that upon smoke indication fire alarm system shall be signaled and conversely upon activation of the fire alarm system shall stop the fan as indicated above. Coordinate with Section 16721.

### 3.12 AIR HANDLING UNIT (Patient Wing)

- A. Alarms:
  1. Filter Bank high differential pressure.
  2. Low supply air alarm.
  3. Smoke detection.
- B. Manual Control and Indication:
  1. H-O-A control.
  2. On-off indication.
  3. Outside temperature reset adjustment.
  4. S/A temperature setpoint.
  5. S/A temperature indication.
  6. M/A temperature indication.
  7. O/A temperature indication.
  8. O/A minimum position adjustment.
  9. Medium efficiency filter differential pressure.
  10. Pre-filter differential pressure.
  11. Duct static pressure setpoint.
  12. Alarm setpoints.
- C. Automated Control:
  1. System shall operate continuously.
  2. Day mode operation:
    - a. During operation a minimum positioner will maintain O/A dampers at 20% minimum position (initial setting, adjustable).
    - b. The S/A desired temperature shall be initially set at 55° F (adjustable). The system shall monitor all zones served by the air handler and when all the zones are adequately cooled the system shall reset the supply air temperature up until the warmest zone is adequately cooled with it's VAV box open to 100%.

- c. The S/A air temperature sensor will modulate the O/A dampers, R/A dampers, heating coil control valve, and cooling coil control valve to maintain S/A temperature setpoint as follows:

O/A temp.	O/A damper	Cooling Coil
Below 55° F	Modulates	Closed
55° F - R/A temp	Modulates to full open	Modulates
Above R/A temp	Min. position	Modulates

- d. VFD Supply Fan: Duct static pressure sensor, two-thirds of the way down the supply duct system, will modulate the variable speed drive to maintain setpoint.
- e. VFD Return Fan: Duct static pressure sensor in the return fan suction plenum will modulate the variable speed drive to maintain set.
- f. On low supply air temperature alarm (initially 40° F, adjustable), delay two minutes, O/A dampers will fully close, R/A dampers will fully open, and an alarm shall signal. Provide automatic reset of alarm after five minutes.
- g. On smoke detection, the fan shall stop, O/A dampers will fully close, R/A dampers will fully open, heating valve control valve will modulate to satisfy S/A temperature sensor. Interconnect with fire alarm system such that upon smoke indication fire alarm system shall be signaled and conversely upon activation of the fire alarm system shall stop the fan as indicated above. Coordinate with Section 16721.

### 3.13 VAV TERMINAL UNITS

#### A. Alarms:

1. High space temperature.
2. Low space temperature.

#### B. Manual Control and Indication:

1. Space temperature setpoint.
2. Space temperature indication.
3. Operation mode schedule adjustment.
4. Operation mode indication.
5. Box CFM maximum setpoint.
6. Box CFM minimum setpoint.
7. Box actual CFM.
8. Box heating coil status, as a percentage open.
9. Alarm setpoints.

#### C. Automated Control:

1. Operation Mode: Day and night mode of operation will be controlled by a seven (7) day time clock.
2. Day Mode: Space sensor will modulate air valve to maintain setpoint.
3. Night Mode: Air valve will be closed.
4. Where the VAV box serves an area with radiant heat or cabinet unit heaters in the space, the radiant heat or cabinet unit heater shall modulate open with the heating coil valve.

### 3.14 KITCHEN EXHAUST FANS AND ASSOC. VAV UNITS (KEF-1 AND KEF-2)

#### A. Alarms:

1. None

#### B. Manual Control and Indication:

1. Fan is controlled by local switch, coordinate with electrical.

2. Associated VAV terminal box units in the kitchen and dining area shall modulate to the fully open position when KEF-1 is operating. When KEF-1 is off the VAV box in the kitchen shall go closed and the VAV box in the dining area shall go to minimum position.

### 3.15 TERMINAL HEATING COILS

- A. Alarms:
  1. High space temperature.
  2. Low space temperature.
- B. Manual Control and Indication:
  1. Space temperature setpoint.
  2. Space temperature indication.
  3. Operation mode schedule adjustment.
  4. Operation mode indication.
  5. Heating coil status, as a percentage open.
  6. Alarm setpoints.
- C. Automated Control:
  1. Operation Mode: Day and night mode of operation will be controlled by a seven (7) day time clock.
  2. Day Mode: Space sensor will modulate valve to maintain setpoint.
  3. Night Mode: Valve will modulate to maintain night heating setpoint.
  4. Where the coil serves an area with radiant heat or cabinet unit heaters in the space, the radiant heat or cabinet unit heater shall modulate open with the heating coil valve.

### 3.16 BUILDING RELIEF/RETURN AIR FANS

- A. Alarms:
  1. High static pressure.
  2. Low static pressure.
  3. No flow.
- B. Manual Control and Indication:
  1. RF-X H-O-A Control.
  2. RF-X On-Off Indication.
  3. Building static pressure setpoint.
  4. Building static pressure indication.
  5. Return air fan suction plenum pressure setpoint.
  6. Return air fan suction plenum pressure indication.
  7. Alarm setpoints.
- C. Automated Control:
  1. Operation Mode: In conjunction with individual air handlers.
  2. Variable Speed: A duct static pressure sensor will modulate the VFD to maintain a negative pressure of in the return air fan suction plenum (adjustable).
  3. Relief air control dampers will modulate to maintain +0.05" (adjustable) to ambient inside the building utilizing an exterior sensors and an surge damper.

### 3.17 VENTILATION FAN (VF-F1,F2)

- A. Alarms:
  1. Low space temperature.



2. High space temperature.
3. Low S/A air temperature (35° F adjustable).
4. High filter differential pressure.

B. Manual Control and Indication:

1. Space temperature setpoint.
2. H-O-A control.
3. On-off indication.
4. S/A temperature setpoint.
5. S/A temperature indication.
6. O/A temperature indication.
7. Alarm setpoints.

C. Automated Control:

1. Unit shall cycle to maintain space temperature setpoint.
2. Disabled: O/A dampers will be closed and R/A dampers open.
3. Enabled: The S/A air temperature sensor will modulate the O/A dampers and R/A dampers to maintain S/A temperature setpoint (initially set at 50° F, adjustable). E/A dampers (VF-F2 only) open in parallel with the O/A dampers.
4. On smoke detection (VF-1 only), the fan shall stop, O/A dampers will fully close and R/A dampers will fully open. Coordinate with Section 16721.

3.18 VENTILATION FAN GREENHOUSE (VF- A1)

A. Alarms:

1. None

B. Manual Control and Indication:

1. Fan is controlled by local switch, coordinate with electrical.
2. When the unit is enabled by a local switch the unit and dampers shall operate to maintain room set point. When the room rises above setpoint the O/A and E/A dampers shall open, upon a farther rise in temperature the ventilation fan shall cycle on to maintain room set point.

3.19 MAKE-UP AIR UNIT (MAU-F1)

A. Alarms:

1. Low S/A air temperature (50° F adjustable).
2. High filter differential pressure.

B. Manual Control and Indication:

1. H-O-A control.
2. On-off indication.
3. S/A temperature setpoint.
4. S/A temperature indication.
5. O/A temperature indication.
6. Alarm setpoints.

C. Automated Control:

1. Unit shall cycle with shop area exhaust systems.
2. Disabled: O/A dampers will be closed and R/A dampers open.
3. Enabled Heating Coil: The S/A air temperature sensor will modulate the pre-heat heating coil control, and heating coil control valve to maintain room temperature setpoint (initially set at 70° F, adjustable).

4. Enabled Outside Air: O/A dampers are closed when the unit is off. When the soldering hood is running the outside air dampers shall be set to 35% open. When the garage exhaust fan is running the outside air dampers shall be set to 65%. When both the soldering hood and the garage exhaust fans are running the outside air dampers shall be set to 100% open.
5. On low discharge alarm (initially 40° F), delay two minutes, then fan shall stop, O/A dampers will fully close and R/A dampers will fully open. Provide automatic reset.

### 3.20 GARAGE EXHAUST FAN (EF-F10)

- A. Alarms:
  1. High CO in Space.
- B. Manual Control and Indication:
  1. H-O-A control.
  2. On-off indication.
- C. Automated Control:
  1. Start/Stop operation of the fan shall be controlled through a carbon monoxide sensor located in the garage. The unit shall start when the CO level in the garage area exceeds 25 ppm (adjustable at the sensor). MAU-F1 shall be interlocked with the exhaust fan.

### 3.21 LAB/EXAM EXHAUST FAN (EF-F1)

- A. Alarms:
  1. High filter differential pressure.
  2. Room low or high differential pressure alarm.
  3. No flow.
- B. Manual Control and Indication:
  1. H-O-A control.
  2. On-off indication.
  3. Filter differential setpoint, adjustable.
  4. Filter differential indication.
  5. Alarm setpoints.
- C. Manual Control and Indication:
  1. Exhaust fan: Unit will whenever the main AHU is running. Coordinate with Electrical.
  2. Room Pressure Control: The room pressure control is maintained by modulating the exhaust air damper to maintain 100 cfm more exhaust air than supply air (adjustable).
  3. The room differential pressure control shall be accomplished by using a differential pressure controller specifically manufactured for isolation rooms. Provide wall alarm display outside of room.

### 3.22 EXHAUST FAN (EF-A1, G1)

- A. Alarms:
  1. No Flow.
- B. Manual Control and Indication:
  1. H-O-A control.
  2. On-off indication.
  3. Operation mode indication.

- C. Automated Control:
  - 1. Operation Mode: Day and night mode of operation will be controlled by a seven (7) day time clock.
  - 2. Night Mode: Unit will not operate.
  - 3. Day Mode: Unit will operate continuously.

### 3.23 EXHAUST FAN (EF-B1, B5, C1, D1, E1, F4, F6)

- A. Alarms:
  - 1. No Flow.
- B. Manual Control and Indication:
  - 1. H-O-A Control.
  - 2. On-off Indication.
- C. Automated Control:
  - 1. Unit will run continuously. Provide maintenance switch. Coordinate with Electrical.

### 3.24 EXHAUST FAN (EF-A2, B2, B3, C2, D3, E3, F7)

- A. Alarms:
  - 1. None
- B. Manual Control and Indication:
  - 1. H-O-A Control.
  - 2. On-off Indication.
- C. Automated Control:
  - 1. Unit will cycle on to maintain room temperature at 75 F (adjustable). On a rise in space temperature above set point the fan shall run. Additionally, EF-F12, has outside and exhaust air dampers that shall open when the fan is running.

### 3.25 EXHAUST FAN (EF-F11)

- A. Alarms:
  - 1. None
- B. Manual Control and Indication:
  - 1. Fan is controlled with toilet room lights, corrdinate with electrical.

### 3.26 EXHAUST FAN (EF- F5, F8)

- A. Alarms:
  - 1. None
- B. Manual Control and Indication:
  - 1. Fan is controlled by local switch, corrdinate with electrical. MAU-F1 shall be interlocked with the EF-F8 exhaust fan.

### 3.27 RADIATION

- A. Alarms:
  - 1. High space temperature.
  - 2. Low space temperature.

- B. Manual Control and Indication:
  - 1. Space temperature day mode setpoint.
  - 2. Space temperature night mode setpoint.
  - 3. Space temperature indication.
  - 4. Operation mode schedule adjustment.
  - 5. Operation mode indication.
  - 6. Alarm setpoints.
- C. Automated Control:
  - 1. Operation Mode: Day and night mode of operation will be controlled by a seven (7) day time clock.
  - 2. Night Mode: Terminal control valve will cycle to maintain night mode setpoint.
  - 3. Day Mode: Terminal control valve will cycle to maintain day mode setpoint.

### 3.28 CABINET UNIT HEATERS

- A. Alarms:
  - 1. High space temperature.
  - 2. Low space temperature.
- B. Manual Control and Indication:
  - 1. Space temperature setpoint.
  - 2. Space temperature indication.
  - 3. Alarm setpoints.
- C. Automated Control:
  - 1. Upon a call for heat the fan will start and the two-way control valve will open to maintain setpoint. When the unit is off the two-way control valve will close.

### 3.29 UNIT HEATERS

- A. Alarms:
  - 1. High space temperature.
  - 2. Low space temperature.
- B. Manual Control and Indication:
  - 1. Space temperature setpoint.
  - 2. Space temperature indication.
  - 3. Alarm setpoints.
- C. Automated Control:
  - 1. Upon a call for heat the fan will start and the two-way control valve will open to maintain setpoint. When the unit is off the two-way control valve will close.
  - 2. Gym Fan Room unit heater coil runs wild. Unit cycles on local thermostat, no remote monitoring or control.

### 3.30 DAY TANK (DT-1)

- A. Controls to be at local panel and by day tank manufacturer. Integrate alarms to Direct Digital Control System. Coordinate with Section 15400.
- B. Alarms:
  - 1. High level.
  - 2. Low level.

## C. Manual Control and Indication:

1. At local panel only.

## D. Automated Control:

1. Provide DDC readout of Daytank alarms.

## 3.31 MAIN FUEL TANK (FT-1)

## A. Level controls and alarms via a stand alone fuel monitoring system. Integrate alarms to Direct Digital Control System. Coordinate with Section 15400.

## B. Alarms:

1. High level.
2. Low level.
3. Leak detection.

## C. Manual Control and Indication:

1. At local panel only.

## D. Automated Control:

1. Provide DDC readout of fuel tank alarms.

## 3.32 COMPUTER ROOM UNITS

## A. Controls to be at local panel and by computer room manufacturer. Integrate alarms to Direct Digital Control System. Coordinate with Section 15900.

## B. Alarms:

1. High space temperature.
2. Low space temperature.

## C. Manual Control and Indication:

1. Room temperature indication.
2. Alarm setpoints.

## D. Automated Control:

1. Provide DDC readout of computer room unit alarms.

## 3.33 FUEL FIRED MAKE-UP AIR UNIT

## A. Controls to be at local panel and by make-up air unit manufacturer. Integrate alarms to Direct Digital Control System. Coordinate with Section 15900.

## B. Alarms:

1. No flow.
2. High space temperature.
3. Low space temperature.

## C. Manual Control and Indication:

1. Room temperature indication.
2. Alarm setpoints.

## D. Automated Control:

1. Interlock with paint booth to start make-up air unit prior to exhaust fan.

2. Provide DDC readout of make-up air unit alarms.

### 3.34 PAINT BOOTH EXHAUST FAN

- A. Controls to be at local panel and by paint booth unit manufacturer.

### 3.35 PATIENT ROOM WATER SHUTOFF CONTROL

- A. Provide a local control panel at each nurses station to allow the staff to switch the water off/on at each patient room within the associated wing.
- B. Manual Control and Indication:
  1. Independently switch off/on the water at each patient room. Each individual patient room's water supply shall have a normally closed valve on the hot and cold water supply serving the associated room.

### 3.36 EMERGENCY GENERATOR AND UPS ROOM

- A. Alarms:
  1. General generator alarm.
  2. High space temperature.
- B. Manual Control and Indication:
  1. Generator running.
  2. Generator room temperature indication.
- C. Automated Control:
  1. When the generator is off the space thermostat will modulate open the outside air dampers if the space is above set point. If the space is below setpoint the unit heater will cycle on to maintain space temperature.
  2. When the generator is running the space thermostat will modulate the outside air, return air, and exhaust air dampers to maintain space setpoint.

### 3.37 EMERGENCY SEWAGE SYSTEM ALARMS

- A. The emergency sewage storage system is required to have two level alarms. The first alarm will signal when liquid is present in the storage pipe, approximately 25% full. The second alarm will signal when the storage pipe is approximately 75% full.

### 3.38 LIGHTING SYSTEM

- A. Gym Lighting: The DDC system shall switch on/off lighting via lighting contactors base upon a time schedule.
- B. Mainstreet Corridor/Wintergarden Lighting: The DDC system shall switch on/off lighting via lighting contactor base upon a time schedule.
- C. Exterior Lighting: The DDC system shall switch on/off lighting via lighting contactor based upon photocell.
- D. Courtyard Lighting: The DDC system shall switch on/off lighting circuits based upon photocell

### 3.38 HEAT TRACE

## **ALASKA PSYCHIATRIC INSTITUTE**

## **SEQUENCE OF OPERATION**

A. Heat Trace Circuit NTSL-44 shall be enabled based when outside air temperature is 34 Deg F or below.

END OF SECTION 15985