MERTARVIK PHASE I POWER SYSTEM

POWER PLANT MODULE

INVITATION TO BID
18045

Prepared for:

ALASKA ENERGY AUTHORITY

813 West Northern Lights Boulevard

Anchorage, Alaska 99503

February 2018

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DIVISION 00 – BIDDING AND CONTRACT REQUIREMENTS (yellow)

DIVISION 08 - OPENINGS

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DIVISION 10 – SPECIALTIES

DIVISIONS 11 – 12 (NOT USED)

DIVISIONS 13 – SPECIAL CONSTRUCTION

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DIVISION 26 – ELECTRICAL

ALASKA ENERGY AUTHORITY

INVITATION TO BID

for Construction Contract

Date February 13, 2018

Mertarvik Phase I Power System: Power Plant Module

Location of Project:	Mertarvik, Alaska
Contracting Officer:	Rich Wooten, CDT, CPSM, PMP
Issuing Office:	ALASKA ENERGY AUTHORITY (AUTHORITY)

State Funded [x] Federal Aid [x]

Description of Work: Work under this Contract consists of the construction of the Phase I Power Plant Module for the community of Mertarvik, Alaska. The Contractor shall provide all labor, materials, and equipment required to construct the Mertarvik Phase I Power System Power Plant Module.

The Engineer's Estimate is between **$400,000.00 - $500,000.00**
All work shall be substantially completed by**: July 15, 2018**
Interim Completion dates, if applicable, will be shown in the General Requirements.

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, in the Willow conference room, 813 West Northern Lights Blvd., Anchorage, Alaska on March 8, 2018.

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: **Mertarvik Phase I Power System: Power Plant Module** **Project Number: 18045**	**ATTN: Contracts** **Alaska Energy Authority** **813 West Northern Lights Blvd.** **Anchorage, AK 99503**

Bids, amendments or withdrawals transmitted by mail must be received in the above specified post office box no later than 7 hours prior to the scheduled time of bid opening. Hand-delivered bids, amendments or withdrawals must be received by the **Front Desk of the Alaska Energy Authority**, prior to the scheduled time of bid opening. Faxed/emailed bid amendments must be addressed to **Rich Wooten, CDT, CPSM, PMP** Fax number: (907) 771-3044, Email: rwooten@aidea.org.

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 Authority 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:

See attached Special Notice to Bidders for this project.

Electronic Plans and Specifications may be ordered, for the price of **$0.00** from:

Alaska Energy Authority
813 West Northern Lights Blvd.
Anchorage, AK 99503

Phone: (907) 771-3019

All questions relating to design features, constructability, quantities, or other technical aspects of the project should be directed to the following. Bidders requesting assistance in viewing the project must make arrangements at least 48 hours in advance with:

David Lockard, P.E., Project Manager Phone: (907) 771- 3062 Fax: (907) 771-3044

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All questions concerning bidding procedures should be directed to:

Rich Wooten, CDT, CPSM, PMP
Contracting Officer
813 West Northern Lights Blvd.
Anchorage, AK 99503

Phone: (907) 771-3019 Email: rwooten@AIDEA.Org

The Bid Calendar, Planholder lists, and Bid Results information are available on the Internet at: www.aidea.org under Procurement Opportunities.

Reminder: 3 AAC 109.220 requires all Bidders to have a valid Alaska Business License and an Alaska Contractor's Certificate of Registration prior to award. To qualify as an Alaska bidder under 3 AAC 109.220, a bidder shall have a valid Alaska business license at time designated in the invitation to bid for bid opening.

Special Notice to Bidders

1. A non-mandatory pre-bid meeting is scheduled for February 20, 2018, 11:00 am in the Aspen Conference room. This is not a mandatory meeting, and there will not be a scheduled site visit prior to the bid opening. Attend by teleconference dial 1-888-585-9008 and when prompted enter code 434756425#.

INFORMATION TO BIDDERS

The Authority 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 examine the available site information 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. The person signing the proposal must initial any erasures or changes made to the bid.

(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 25D-14), or a certified check, cashier's check or money order made payable to the Alaska Energy Authority. 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 requirements of bid security accompanying the bid. An individual surety will not be accepted as a bid security.

The Authority will hold the bid securities of the two lowest bidders until the Contract has been executed, after which they will be returned. All other 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 Authority 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 work.

Bidders either directly or through their suppliers and subcontractors must clearly demonstrate they have construction experience building diesel power generation systems for remote sub-arctic and arctic communities. Bidders who fail to adequately demonstrate meeting these requirements may be determined to be non-responsive and their bid may be rejected.

Minimum Qualifications - The Authority requires the following:

a) Bidders either directly or through their suppliers and subcontractors must have experience within the last 10 years in constructing remote Alaska diesel power generation systems. If asked, Bidder must be able to provide examples of 2-projects similar to the one described herein.

b) Bidders must have a fabrication facility with adequate space and appropriate equipment as required to perform the work. The Authority may inspect the bidders shop after the bid opening and prior to award in order to verify Bidder qualifications.

SUBMISSION OF BIDS

Bids must be submitted as directed on the Invitation To Bid. 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 the bidder received no addenda, the word "None" should be shown as specified.

Every effort will be made by the Authority 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, 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 To Bid. 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 To Bid.

All questions must be received 72 hours before the bid opening. Questions submitted after the deadline may be rejected by the Authority.

WITHDRAWAL OR REVISION OF BIDS

A bidder may withdraw or revise a bid after it has been deposited with the Authority, 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.

Emailed 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 25D-16 shall be used to submit such modifications.

RECEIPT AND OPENING OF BIDS

(a) The Authority must receive all bids, including any amendment or withdrawal prior to the scheduled time of bid opening. Any bid, amendment, or withdrawal that has not actually been received by the Authority 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 Authority for the premature opening of, or failure to open, a bid improperly addressed or identified.

(c) The Authority 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 Authority 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 Authority'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 Authority 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.

ALASKA ENERGY AUTHORITY

SUPPLEMENTARY INFORMATION TO BIDDERS

This document modifies or adds to the provisions of Alaska Energy Authority's form 25D-3, INFORMATION TO BIDDERS.

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 AUTHORITY 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 nonresponsive."

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 AUTHORITY's intent to Award the Contract and the successful Bidder will be requested to execute certain documents, including the Contract form and bonds."

SECTION 00115

ITEM G-115 WORKER MEALS AND LODGING, OR PER DIEM

DESCRIPTION

115-1.1 This item consists of complying with the Alaska Department of Labor and Workforce Development (DOLWD) requirements for Worker Meals and Lodging, or Per Diem; as described in their May 10, 2013 memo WHPL #197(A4) and the State Laborer's and Mechanic's Minimum Rates of Pay (current issue).

Ensure subcontractors comply with the DOLWD requirements. The direct internet address is http://www.labor.state.ak.us/lss/pamp600.htm.

Ensure facilities meet the Alaska Administrative Code 8 AAC 61.1010 and 8 AAC 61.1040 *Occupational Safety and Health Standards*, 18 AAC 31 *Alaska Food Code*, and U. S. Code of Federal Regulations 29 CFR Section 1910.142 *Temporary Labor Camps*.

Do not consider the cost of Meals and Lodging or Per Diem in setting wages for the worker or in meeting wage requirements under AS 23.10.065 or AS 36.05.

METHOD OF MEASUREMENT

115-2.1 Worker Meals and Lodging, or Per Diem will not be measured.

BASIS OF PAYMENT

115-3.1 Payment for Worker Meals and Lodging, or Per Diem is subsidiary to the contract.

(ONLY APPLICABLE TO ADDITIVE ALTERNATE ONE)

ALASKA ENERGY AUTHORITY

REQUIRED DOCUMENTS

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

1. **Bid Form (Form 25D-9)**
2. **Bid Schedule**
3 **Bid Security**
4. Any bid revisions must be submitted by the bidder prior to bid opening on the following form:

   Bid Modification (Form 25D-16)

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 25D-5)**
2. **Bid Breakdown Form (see 01 11 13)**

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. **Construction Contract (Form 25D-10A)**
2. **Payment Bond (Form 25D-12)**
3. **Performance Bond (Form 25D-13)**
4. **Contractor's Questionnaire (Form 25D-8)**
5. **Certificate of Insurance** (from carrier)

ALASKA ENERGY AUTHORITY

PROPOSAL

of

NAME _____

ADDRESS _____

_____

To the CONTRACTING OFFICER, ALASKA ENERGY AUTHORITY:

In compliance with your Invitation To Bid dated **February 13, 2018**, the Undersigned proposes to furnish and deliver all the materials and do all the work and labor required in the construction of Project:

Project Name

Mertarvik Phase I Power System:
Power Plant Module

Project No. 18045

F.O.B. **Anchorage, Alaska**, according to the plans and specifications and for the amount and prices named herein as indicated on the Bid Schedule consisting of **2** sheet(s), which is made a part of this Bid.

The Undersigned declares that he has carefully examined the contract requirements

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 proposal, and it is hereby mutually understood and agreed that in case the Undersigned does not, the accompanying bid guarantee shall be forfeited to the Alaska Energy Authority, 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 after the effective date of Notice to Proceed and to be substantially complete and ready for operational testing and commissioning of the power plant module in Anchorage, Alaska by **July 16, 2018**, unless extended in writing by the Contracting Officer. Final inspection and completion shall be on or before **August 1, 2018** unless extended in writing by the Contracting Officer.

The Undersigned proposes to furnish Payment Bond in the amount of 100% (of the contract) 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).

Addendum Number	Date Issued	Addendum Number	Date Issued	Addendum 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

_____
Name and Title of Person Signing

_____
Telephone Number

_____
Fax Number

BID SCHEDULE

Mertarvik Phase I Power System:
Power Plant Module

Project No. 18045

Bidders Please Note: Before preparing this bid schedule, read carefully, "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.

Contract award shall be made on the basis of the total Base Bid plus additive alternates as selected by Alaska Energy Authority. If Bid Alternates are included in the Bid Documents, the Alaska Energy Authority reserves the right to award some, none, or all of the alternates. Alternates may be awarded in any order in the best interest of the Alaska Energy Authority

Conditioned or qualified bids will be considered non-responsive.

Base Bid:

Bid Item	Description	Lump Sum Price
A	Construct Phase I Power System Power Plant Module as further detailed in Section 01 11 13 Summary of Work.	$
	Total Base Bid	

Additive Alternates (Davis Bacon Required):

Bid Item	Description	Lump Sum Price
B	Provide startup and operational testing of the completed power plant in Mertarvik Alaska. As further detailed in Section 01 11 13 Summary of Work.	$
TOTAL BID: SUM OF BASE BID AND ADDITIVE ALTERNATES		$

Bidder is required to bid on all bid items, including all Additive Alternates.

See Specification Section 01 11 13 Summary of Work for detailed descriptions of each bid item and additive alternate.

_____

Contractor's Name (Printed)

_____ _____

Alaska Contractor's Registration # Expires

_____ _____

Alaska Business License # Expires

ALASKA ENERGY AUTHORITY

BID BOND

For

Mertarvik Phase I Power System: Power Plant Module

DATE BOND EXECUTED: _____

PRINCIPAL (Legal name and business address):	TYPE OF ORGANIZATION:
	[ ] Individual [ ] Partnership [ ] Joint Venture [ ] 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 the above-referenced Project in accordance with contract documents filed in the office of the Contracting Officer, and under the Invitation To Bid 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)

Surety A	Name of Corporation		State of Incorporation	Liability Limit **$**
Signature(s)	**1.**	**2.**		Corporate Seal
Name(s) & Titles (Typed)	**1.**	**2.**		

Surety B	Name of Corporation		State of Incorporation	Liability Limit **$**
Signature(s)	**1.**	**2.**		Corporate Seal
Name(s) & Titles (Typed)	**1.**	**2.**		

Surety C	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.

ALASKA ENERGY AUTHORITY

BID MODIFICATION

Mertarvik Phase I Power System: Power Plant Module

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 Authority.

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

TOTAL REVISION: $_____

_____
Name of Bidding Firm

_____
Responsible Party Signature **Date**

This form may be duplicated if additional pages are needed.

ALASKA ENERGY AUTHORITY

SUBCONTRACTOR LIST

Mertarvik Phase I Power System: Power Plant Module

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 Authority.

Failure to submit this form with all required information by the due date will result in the bidder being declared nonresponsive 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 above-referenced project will be accomplished without subcontracts greater than ½ of 1% of the contract amount.

or

[ ] Subcontractor List is as follows:

LIST FIRST TIER SUBCONTRACTORS ONLY

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

CONTINUE SUBCONTRACTOR INFORMATION ON REVERSE

For projects with federal-aid funding, I hereby certify Alaska Business Licenses and Contractor's Registrations will be valid for all subcontractors prior to award of the subcontract. For projects without federal-aid funding (State funding only), 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

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

ALASKA ENERGY AUTHORITY

CONSTRUCTION CONTRACT

Mertarvik Phase I Power System: Power Plant Module

This CONTRACT, between the ALASKA ENERGY AUTHORITY, herein called the Authority, 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 Authority, 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 Authority. In no event shall the Authority 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 Authority. 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 Authority, on or before: _____ or within _____ calendar days. 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 Authority, to complete the furnishing and delivery of materials and the doing and performance of the work before the aforesaid date, the Authority 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 Authority shall have the right to recover _____ Dollars (**$**_____) 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 Name and Title

Date

(Corporate Seal)

ALASKA ENERGY AUTHORITY

Signature of Contracting Officer

Typed Name

Date

ALASKA ENERGY AUTHORITY

PERFORMANCE BOND

Bond No. _____

For

Mertarvik Phase I Power System: Power Plant Module

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 Alaska Energy Authority 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 Energy Authority Authorized Representative **Date**

See Instructions on Reverse

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.

ALASKA ENERGY AUTHORITY

PAYMENT BOND

Bond No. _____

For

Mertarvik Phase I Power System: Power Plant Module

_____

NOW 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 Energy Authority Authorized Representative **Date**

See Instructions on Reverse

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.

ALASKA ENERGY AUTHORITY

CONTRACTOR'S QUESTIONNAIRE

Mertarvik Phase I Power System: Power Plant Module

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 Authority?
[ ] 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**

ALASKA ENERGY AUTHORITY
SECTION 00 70 00
GENERAL CONDITIONS

.

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.

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 to be interpreted as defined.

Addenda - All clarifications, corrections, or changes issued graphically or in writing by the AUTHORITY 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 AUTHORITY 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. 'Approved' or 'Approval' as used in this contract document shall mean that the Authority has received a document, form or submittal from the Contractor and that the Authority has taken "No exceptions" to the item submitted. Unless the context clearly indicates otherwise, approved or approval shall not mean that the Authority 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.

A.S - Initials which stand for Alaska Statute.

Authority - The Alaska Energy Authority (AEA). References to "Contracting Agency" means the AUTHORITY. The AUTHORITY is acting as an agent for Owner.

Award - The acceptance, by the AUTHORITY, 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 AUTHORITY directing changes to the Contract Documents, within their general scope.

Consultant - The person, firm, or corporation retained directly by the AUTHORITY to prepare Contract Documents, perform construction administration services, or other Project related services. References to Authority's Consultants shall include Engineer.

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 AUTHORITY 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 AUTHORITY 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 Executive Director to enter into and administer the Contract on behalf of the AUTHORITY; who 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, contracts with the AUTHORITY for performance of the Work.

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

CONTRACTOR's Release – CONTRACTOR's written notification to the AUTHORITY specifying final payment due and releasing the AUTHORITY of any and all claims.

Contract Time - 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.

Controlling Item - Any feature of the Work on the critical path of a network schedule.

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

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 AUTHORITY and are by reference made a part of the Contract Documents.

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

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.

Final Completion - The Project has progressed to the point that all required Work is complete..

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

General Requirements - Sections of Division l of the Specifications which contain administrative and procedural requirements as well as requirements for temporary facilities which apply to Specification Divisions 2 through l6.

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

1. New Years Day - January l
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 (l2) 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.

Interim Work Authorization - A written order by the Project Manager initiating changes to the Contract within its general scope, until a subsequent Change Order is executed.

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

Materials - Any substances specified for use in the construction of the project.

Notice of Intent to Award - The written notice by the AUTHORITY to all Bidders identifying the apparent successful Bidder and establishing the AUTHORITY'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.

Onsite Project Representative - The Engineer's authorized representative assigned to make detailed observations relating to contract performance.

Owner – Means Grantee for whom the ALASKA ENERGY AUTHORITY is acting as an agent of.

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.

Pre-construction Conference - A meeting between the CONTRACTOR, Project Manager and the Engineer, and other parties affected by the construction, to discuss the project before the CONTRACTOR begins work.

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

Procurement Manager/Officer - The person authorized by the Contracting Officer to administer the Contract on behalf of the AUTHORITY; who has authority to make findings, determinations and decisions with respect to the Contract and, when necessary present such to the Contracting Officer, to modify or terminate 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.

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 AUTHORITY.

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.

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

Schedule of Values - 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. Where used in the Contract Documents, “Shop Drawings” shall also mean “Submittals”.

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 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 AUTHORITY 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, material man, 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.

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."

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 AUTHORITY 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 AUTHORITY 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.

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 The performance or nonperformance of the Contracting Officer or his authorized representative, shall not give rise to any contractual obligation or duty to the CONTRACTOR, any Subcontractor, any Supplier, or any other organization performing any of the Work or any Surety representing them.

2.2 Evaluations by Contracting Officer:

2.2.1 The Contracting Officer or his authorized representative 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 AUTHORITY 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 AUTHORITY 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 AUTHORITY shall furnish to the CONTRACTOR up to six 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 AUTHORITY 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 AUTHORITY 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 AUTHORITY or any of the AUTHORITY'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.

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 AUTHORITY 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 AUTHORITY shall have or acquire any title to or ownership rights in any of the Contract Documents (or copies thereof) prepared by or for the AUTHORITY 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 AUTHORITY.

ARTICLE 4 - LANDS AND PHYSICAL CONDITIONS

4.l Availability of Lands:

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

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:

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 AUTHORITY 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.

4.4 Utilities:

4.4.1 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 AUTHORITY 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 Project Manager. 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 AUTHORITY, 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 Project Manager. The Project Manager 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.l7. 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 AUTHORITY 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 shall be provided to the AUTHORITY 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. Survey notes are to be in a format acceptable to the AUTHORITY.

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 AUTHORITY (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.

5.3 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 AUTHORITY, or if any such Surety fails to furnish reports as to his financial condition as requested by the AUTHORITY, the CONTRACTOR shall within five days thereafter substitute another bond and Surety, both of which must be acceptable to AUTHORITY.

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 AUTHORITY 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 AUTHORITY covering injury to persons and/or property suffered by the Alaska Energy Authority 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 and minimum limits of liability. 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. 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 Authority 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.

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. 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
$2,000,000 aggregate

2. If the CONTRATOR carries a *Commercial General Liability* policy, the limits of liability shall not be less than:

$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 Authority and the Owner shall be named as "Additional Insured" under all liability coverages listed above.

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: Coverage shall be on an "All Risk" completed value basis including "quake and flood" and protect the interests of the AUTHORITY, the CONTRACTOR and Subcontractors at all tiers. Coverage shall include all materials, supplies and equipment that are intended for specific installation in the Project while such materials, supplies and equipment are located at the Project site, in transit from port of arrival to job site, or while temporarily located away from the Project site.

In addition to providing the above coverages the CONTRACTOR shall require that all indemnities obtained from any SUBCONTRACTORS be extended to include the Authority and Owner as an additional named indemnitees. CONTRACTOR shall further require that the Authority and the Owner be named as additional insured on all liability insurance policies maintained by all SUBCONTRACTORS under their contracts with CONTRACTOR, and that an appropriate waiver of subrogation in favor of the Authority be obtained with respect to all other insurance policies.

e. Other Coverages: As specified in the Supplementary Conditions, if required.

5.4.3 a. 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 AUTHORITY and the Owner and to add the ALASKA ENERGY AUTHORITY and the Owner as additional named indemnitees and as additional insured.

b. Evidence of insurance shall be furnished to the AUTHORITY prior to the award of the contract. Such evidence, executed by the carrier's representative and issued to the AUTHORITY, 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 AUTHORITY of deficient evidence does not constitute a waiver of contract requirements.

c. 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)."

5.5 Indemnification:

The CONTRACTOR shall indemnify, save harmless, and defend the AUTHORITY, the

OWNER 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 AUTHORITY's negligence.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.l 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 Project Manager 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 AUTHORITY. 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 Project Manager 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 Project Manager may, in writing, require the CONTRACTOR to remove from the Work any employee the Project Manager deems incompetent, careless, or otherwise detrimental to the progress of the Work, but the Project Manager 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 Project Manager, 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 AUTHORITY or any of the AUTHORITY'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 paragraph 2.3.

6.6 Anticipated Schedules:

6.6.1 Prior to submitting the CONTRACTOR's first Application for Payment the CONTRACTOR shall submit to the Project Manager for review an anticipated progress schedule indicating the starting and completion dates of the various stages of the Work.

6.6.2 Prior to submitting the CONTRACTOR's first Application for Payment, the CONTRACTOR shall submit to the Project Manager 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 Project Manager and the CONTRACTOR will finalize schedules required by paragraph 6.6. The finalized progress schedule will be acceptable to the AUTHORITY 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 AUTHORITY 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 AUTHORITY as providing a workable arrangement for processing the submissions. If accepted, the finalized Schedule of Values will be acknowledgment by the AUTHORITY 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 AUTHORITY 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 Project Manager 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 Project Manager 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 Project Manager only if sufficient information is submitted by the CONTRACTOR which clearly demonstrates to the Project Manager that the material or equipment proposed is equivalent or equal in all aspects to that named. The procedure for review by the Project Manager 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 Project Manager 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 Project Manager 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 AUTHORITY 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 AUTHORITY in evaluating the proposed substitute. The AUTHORITY may require the CONTRACTOR to furnish at the CONTRACTOR's expense additional data about the proposed substitute. The Project Manager may reject any substitution request which the Project Manager determines is not in the best interest of the OWNER.

6.9.5 Substitutions shall be permitted during or after the bid period as allowed and in accordance with Document 00 02 00 - Invitation for Bids, Document 00 70 00 – General Conditions, and Document 01 60 00 – Materials and Equipment.

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 Project Manager, if the CONTRACTOR submits sufficient information to allow the Project Manager to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by the Project Manager will be similar to that provided in paragraph 6.9 as applied by the Project Manager and as may be supplemented in the General Requirements.

6.11 Evaluation of Substitution:

The Project Manager will be allowed a reasonable time within which to evaluate each proposed substitute. The Project Manager 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 shall contain provisions for prompt payment, release of retainage, and interest on late payment amounts and retainage as specified in AS 36.90.210. Contracts between subcontractors, regardless of tier, must also contain these provisions.

6.13.2 The CONTRACTOR shall be fully responsible to the AUTHORITY 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 AUTHORITY 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 AUTHORITY and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of the AUTHORITY 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 AUTHORITY 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 AUTHORITY by any such owner or occupant because of the performance of the Work, the CONTRACTOR shall hold the AUTHORITY 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 Project Manager for reference and copying. Upon completion of the Work, the annotated record documents, samples and Shop Drawings will be delivered to the Project Manager. 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 Project Manager.

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 AUTHORITY, is obligated to act to prevent threatened damage, injury or loss. The CONTRACTOR shall give the Project Manager 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 AUTHORITY 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 Project Manager.

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 Project Manager 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 Project Manager 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 Project Manager to review the information as required.

6.20.2 The CONTRACTOR shall also submit to the Project Manager 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 Project Manager 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 Project Manager 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 AUTHORITY 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 AUTHORITY of his intent. The AUTHORITY may require the CONTRACTOR to furnish at the CONTRACTOR's expense additional data about the proposed variation. The Project Manager may reject any variation request which the Project Manager determines is not in the best interest of the AUTHORITY.

6.21 Shop Drawing and Sample Review:

6.21.1 The Project Manager will review with reasonable promptness Shop Drawings and samples, but the Project Manager'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 Project Manager 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 Project Manager on previous submittals.

6.21.2 The Project Manager'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 Project Manager 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 AUTHORITY shall be responsible for all AUTHORITY review costs resulting from the initial submission and the resubmittal. The CONTRACTOR shall, at the discretion of the AUTHORITY, pay all review costs incurred by the AUTHORITY 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 Project Manager'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 AUTHORITY. 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.l 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 AUTHORITY 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 AUTHORITY or its assigned representative may perform an audit of these records during normal work hours after written notice to the CONTRACTOR.

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.

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 AUTHORITY 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 AUTHORITY 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 AUTHORITY 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 AUTHORITY, 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 AUTHORITY 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 AUTHORITY are at variance with any Regulatory Requirements, CONTRACTOR shall give the Project Manager 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 Project Manager. 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 Project Manager, the CONTRACTOR shall bear all costs arising there from; however, it shall not be the CONTRACTOR’s primary responsibility to make certain that the Specifications and Drawings supplied by the AUTHORITY are in accordance with such Regulatory Requirements.

7.5 Accident Prevention:

The CONTRACTOR shall comply with AS l8.60.075 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 AUTHORITY 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 ventures 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.l0.025 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 Project Manager. 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: Not Applicable.

7.13 Preferential Employment: Not Applicable.

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 to the Work 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. 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.

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 AUTHORITY 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.

7.14.3 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 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.

7.l5 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 AUTHORITY 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 $l0.00 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 AUTHORITY employees authorized as his representatives, either personally or as officials of the AUTHORITY, it being always understood that in such matters they act as agents and representatives of the AUTHORITY.

ARTICLE 8 - OTHER WORK

8.l Related Work at Site:

8.1.1 The AUTHORITY 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 AUTHORITY 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 Project Manager of such required increase within fifteen (15) calendar days following receipt of the Contracting Officer's notice. Should the Project Manager 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 AUTHORITY (or the AUTHORITY, if the AUTHORITY is performing the additional work with the AUTHORITY'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 Project Manager. 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 AUTHORITY 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 AUTHORITY, the CONTRACTOR shall inspect and promptly report to the Project Manager 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 non-apparent defects and deficiencies in the other work.

8.4 Coordination:

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

ARTICLE 9 - CHANGES

9.1 AUTHORITY's Right to Change

Without invalidating the Contract and without notice to any Surety, the AUTHORITY 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 Authority-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 AUTHORITY'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 Project Manager 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 Project Manager may order the Contractor to correct Defective Work or methods which are not in conformance with the Contract Documents.

9.3.4 The Project Manager 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 Project Manager, 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 Project Manager depicting such increases before proceeding with the Directive, except in the case of an emergency. If the Project Manager finds the increase in Contract Price or the extension of Contract Time justified, a Change Order will be issued. If however, the Project Manager does not find that a Change Order is justified, the Project Manager may direct the CONTRACTOR to proceed with the Work. The CONTRACTOR shall cooperate with the Project Manager 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 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. A Change Order shall be considered executed when it is signed by the AUTHORITY.

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 Project Manager, must be authorized by a Supplemental Agreement signed by the appropriate representatives of the AUTHORITY 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 Project Manager 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 Project Manager shall promptly investigate the conditions, and if the Project Manager 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 Project Manager shall be given the opportunity to supervise and check the keeping of such records.

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.

ARTICLE l0 - 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 l5, 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.l 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.l through 10.9.3, inclusive).

10.3.2 By mutual acceptance of a lump sum price that 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 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%.

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.

l0.4 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 AUTHORITY, 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 l0.5:

10.4.l 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 AUTHORITY 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 manual workers up through the level of foreman but shall not include general foremen, superintendents, and non-manual employees. 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 AUTHORITY.

10.4.2 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. All cash discounts shall accrue to the CONTRACTOR unless the AUTHORITY deposits funds with the CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to the AUTHORITY. All trade discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to the AUTHORITY, 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 AUTHORITY, CONTRACTOR shall obtain competitive quotes from Subcontractors or Suppliers acceptable to the CONTRACTOR and shall deliver such quotes to the AUTHORITY 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' "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 AUTHORITY 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.

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 AUTHORITY 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 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.

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 AUTHORITY. 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 AUTHORITY 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 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 l0.4.l or specifically covered by paragraph l0.4.4 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 l0.4.5.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 l0.4.

10.6 CONTRACTOR's Fee:

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

10.6.l 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.l 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 l0.4.4, 10.4.5 and 10.5;

d. The amount of credit to be allowed by the CONTRACTOR to the AUTHORITY 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 AUTHORITY 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 AUTHORITY 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 Project Manager will determine the actual quantities and classifications of Unit Price Work performed by the CONTRACTOR. The Project Manager will review with the CONTRACTOR preliminary determinations on such matters before finalizing the costs and quantities on the Schedule of Values. The Project Manager'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 Project Manager written notice of intention to appeal from such a decision.

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 Project Manager 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 Substantial 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.

11.3.3 The Contract Time shall be as stated is 00800, Supplementary Conditions.

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 AUTHORITY in its contractual capacity, acts of another contractor in the performance of a contract with the AUTHORITY, 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 Project Manager 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 AUTHORITY that the date of beginning and the time for Substantial 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 AUTHORITY 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 AUTHORITY 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 AUTHORITY will sustain by reason of delayed completion. These liquidated and actual damages are intended as compensation for losses anticipated arising, and including 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 AUTHORITY costs, fees, and charges related to reprocurement. 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.

For each calendar day that the work remains incomplete after the expiration of the Contract Time, liquidated damages in the amount as stated in 00800, Supplemental Conditions shall be assessed to the CONTRACTOR. If no money is due the CONTRACTOR, the AUTHORITY shall have the right to recover said sum from the CONTRACTOR, the surety or both. The amount of these deductions is to reimburse the AUTHORITY 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 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 AUTHORITY of any of its rights under the Contract.

ARTICLE l2 - QUALITY ASSURANCE

12.1 Warranty and Guaranty:

The CONTRACTOR warrants and guarantees to the AUTHORITY 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 AUTHORITY and the AUTHORITY's consultants, 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.l The CONTRACTOR shall give the Project Manager 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 therefore, pay all costs in connection therewith and furnish the Project Manager 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 AUTHORITY'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 AUTHORITY 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 Project Manager, it must, if requested by the Project Manager, be uncovered for observation. Such uncovering shall be at the CONTRACTOR's expense unless the CONTRACTOR has given the Project Manager timely notice of CONTRACTOR's intention to cover the same and the Project Manager has not acted with reasonable promptness in response to such notice.

12.3.5 Neither observations nor inspections, tests or Approvals by the AUTHORITY 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 Project Manager, it must, if requested by the Project Manager, be uncovered for the Project Manager's observation and replaced at the CONTRACTOR's expense.

12.4.2 If the Project Manager considers it necessary or advisable that covered Work be observed inspected or tested, the CONTRACTOR, at the Project Manager's request, shall uncover, expose or otherwise make available for observation, inspection or testing as the Project Manager 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 AUTHORITY 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 AUTHORITY 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 Project Manager, 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 Project Manager, 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 Substantial Completion of the relevant portion of the Work 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 AUTHORITY and in accordance with the Project Manager's written instructions, either correct such Defective Work, or, if it has been rejected by the Project Manager, 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 AUTHORITY 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

AUTHORITY 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 Project Manager may accept Defective Work, the CONTRACTOR shall bear all direct, indirect and consequential costs attributable to the Project Manager'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 AUTHORITY shall be entitled to an appropriate decrease in the Contract Price. If the AUTHORITY has already made final payment to the CONTRACTOR, an appropriate amount shall be paid by the CONTRACTOR or his Surety to the AUTHORITY.

12.9 AUTHORITY May Correct Defective Work:

If the CONTRACTOR fails within a reasonable time after written notice from the Project Manager to proceed to correct Defective Work or to remove and replace rejected Work as required by the Project Manager 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 AUTHORITY 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 AUTHORITY shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, the Project Manager 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 AUTHORITY has paid the CONTRACTOR but which are stored elsewhere. The CONTRACTOR shall allow the Project Manager and his authorized representatives such access to the site as may be necessary to enable the Project Manager to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of the AUTHORITY 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 AUTHORITY 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 Project Manager, of the AUTHORITY'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 Project Manager. 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 Project Manager 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.

13.4 Review of Applications for Progress Payment:

Project Manager will either indicate in writing a recommendation of payment or return the Application for Payment to the CONTRACTOR indicating in writing the Project Manager'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 AUTHORITY 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 AUTHORITY's interest therein, all of which will be satisfactory to the Project Manager. 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 AUTHORITY 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 AUTHORITY 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 AUTHORITY has been required to correct Defective Work or complete Work in accordance with paragraph l2.9.

13.7.4 The AUTHORITY's actual knowledge of the occurrence of any of the events enumerated in paragraphs l4.2.l.a through l4.2.1.k inclusive.

13.7.5 Claims have been made against the AUTHORITY or against the funds held by the AUTHORITY on account of the CONTRACTOR's actions or inactions in performing this Contract, or there are other items entitling the AUTHORITY 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.l 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 AUTHORITY 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 l0% of the total amount earned on all subsequent progress payments. This retainage may be released at such time as the Project Manager finds that satisfactory progress is being made.

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 AUTHORITY, 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 AUTHORITY 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 Project Manager 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 AUTHORITY issue a certificate of Substantial Completion. Within a reasonable time thereafter, the Project Manager, the CONTRACTOR and Engineer(s) shall make an inspection of the Work to determine the status of completion. If the Project Manager does not consider the Work substantially complete, the Project Manager will notify the CONTRACTOR in writing giving the reasons therefore. If the Project Manager considers the Work substantially complete, the Project Manager 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 Project Manager 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 AUTHORITY shall be responsible for all AUTHORITY costs resulting from the initial inspection and the first re-inspection, the CONTRACTOR shall pay all costs incurred by the AUTHORITY resulting from re-inspections, thereafter.

13.11 Access Following Substantial Completion:

The AUTHORITY shall have the right to exclude the CONTRACTOR from the Work after the date of Substantial Completion, but the AUTHORITY 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 Project Manager will make a final inspection with the CONTRACTOR and Engineer(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 AUTHORITY 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 Project Manager and delivered schedules, guarantees, bonds, certificates of payment to all laborers, Subcontractors and Suppliers, and other documents - all as required by the Contract Documents; and after the Project Manager 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 Project Manager's observation of the Work during construction and final inspection, and the Project Manager's review of the final Application for Payment and accompanying documentation - all as required by the Contract Documents; and the Project Manager is satisfied that the Work has been completed and the CONTRACTOR's other obligations under the Contract Documents have been fulfilled, the AUTHORITY will process final Application for Payment. Otherwise, the Project Manager 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 Project Manager 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 AUTHORITY 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.l, 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 AUTHORITY 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 AUTHORITY will issue a letter of Final Acceptance, releasing the CONTRACTOR from further obligations under the Contract, except as provided in paragraph 13.17.

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) 01 77 00, such Work shall constitute a continuing obligation under the Contract.

13.l6 CONTRACTOR's Continuing Obligation:

The CONTRACTOR's obligation to perform and complete the Work and pay all laborers, Subcontractors, and material men in accordance with the Contract Documents shall be absolute. Neither any progress or final payment by the AUTHORITY, nor the issuance of a certificate of Substantial Completion, nor any use or occupancy of the Work or any part thereof by the AUTHORITY or Owner, nor any act of acceptance by the AUTHORITY 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 AUTHORITY 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.l7 Waiver of Claims by CONTRACTOR:

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

13.18 No Waiver of Legal Rights:

The AUTHORITY 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 therefore, 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 AUTHORITY 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 AUTHORITY, or any representative of the AUTHORITY, 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 AUTHORITY, 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 AUTHORITY of any breach of the Contract shall not be held to be a waiver of any other subsequent breach.

ARTICLE l4 - SUSPENSION OF WORK, DEFAULT AND TERMINATION

14.lAUTHORITY May Suspend Work:

14.1.1 The AUTHORITY 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 therefore 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 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

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 Authority 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 Authority. The Authority 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 AUTHORITY 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 AUTHORITY 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 AUTHORITY has paid the CONTRACTOR but which are stored elsewhere, and finish the Work as the AUTHORITY may deem expedient. The AUTHORITY 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 AUTHORITY 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 Authority 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 Authority 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 Authority 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 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 Authority will make subsequent Contract payments directly to the Surety for work performed under the terms of the Contract. CONTRACTOR forfeits any right to claim for the same work or any part thereof. CONTRACTOR is 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 therefore, 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 AUTHORITY 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 reprocurement 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 AUTHORITY and any amounts due to persons for whose benefit the AUTHORITY has withheld funds, such excess shall be paid by the AUTHORITY to the CONTRACTOR. If the damages, costs, and expenses due the AUTHORITY 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 AUTHORITY, the termination will not affect any rights or remedies of the AUTHORITY against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due the CONTRACTOR by the AUTHORITY will not release the CONTRACTOR from liability.

14.4 Convenience Termination:

14.4.1 The performance of the Work may be terminated by the AUTHORITY 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 OWNER. Any such termination shall be effected by delivery to the CONTRACTOR of a Notice of Termination, specifying termination is for the convenience of the AUTHORITY 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 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 AUTHORITY;

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 AUTHORITY has or may acquire any interest.

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

14.4.3 When the AUTHORITY 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 AUTHORITY - 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 AUTHORITY 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 AUTHORITY. 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 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 AUTHORITY'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 AUTHORITY 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 AUTHORITY; 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 AUTHORITY said termination shall not affect or terminate any of the rights of the AUTHORITY 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 AUTHORITY 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 AUTHORITY 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. Cost Principles. The Authority 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."

ARTICLE l5 - CLAIMS AND DISPUTES

15.1 Notification

15.1.1 The CONTRACTOR shall notify the AUTHORITY 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 AUTHORITY 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 AUTHORITY 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 AUTHORITY 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 AUTHORITY will not grant an extension of Contract Time if the CONTRACTOR does not timely submit revised schedules under **Section 01 32 00**.

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 AUTHORITY within the next 14 days.

15.1.4 If the CONTRACTOR believes additional compensation or time is warranted, then he must 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 AUTHORITY access to any such records and furnish the AUTHORITY 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 Authority 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 Authority.

15.1.5 If the claim or dispute is not resolved by the Project Manager, 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 AUTHORITY 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 AUTHORITY'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 AUTHORITY can make written request to the CONTRACTOR at any time for additional information relative to the Claim. The CONTRACTOR shall provide the AUTHORITY 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

15.4.1 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. 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 Executive Director of the Authority.

15.5 Appeals on a Contract Claim.

15.5.1 An appeal from a decision of the Contracting Officer on a contract claim may be filed by the CONTRACTOR with the Executive Director of the Authority. The appeal shall be filed within 14 days after the decision is received by the CONTRACTOR. An appeal by the CONTRACTOR may not raise any new factual issues or theories of recovery that were not presented to and decided by the Contracting Officer in the decision under Section 15.4, except that a CONTRACTOR may increase the contractor's calculation of damages if the increase arises out of the same operative facts on which the original claim was based. The CONTRACTOR shall file a copy of the appeal with the Contracting Officer.

a. An appeal must contain a copy of the decision being appealed and identification of the factual or legal errors in the decision that form the basis for the appeal.

b. The Executive Director shall handle the appeal of a claim under this section expeditiously.

15.6 Construction Contract Claim Appeals.

15.6.1 The appeal from a decision of the Contracting Officer of a claim involving a construction contract shall be resolved by:

a. binding and final arbitration under AS 09.43.010 - 09.43.180 (Uniform Arbitration Act) if the claim is:

1. less than $250,000 and the CONTRACTOR requests arbitration of the claim; or
2. $250,000 or more and both the agency and the CONTRACTOR agree to arbitration of the claim; or

b. a hearing under the Authority's established policy and procedures if the claim is not handled by arbitration under 15.6.1 of this subsection.

15.7 Fraud and Misrepresentation in Making Claims

Criminal and Civil penalties authorized under State or federal law (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 AUTHORITY at any stage of prosecuting a claim under this Contract."

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SECTION 00 80 00
SUPPLEMENTARY CONDITIONS
MODIFICATIONS TO THE GENERAL CONDITIONS

The following supplements modify, change, delete from, or add to Section 00 70 00 "General Conditions of the Construction Contract for Buildings", revised December, 2011. Where any article of the General Conditions is modified, or a Paragraph, Subparagraph, or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph, or Clause shall remain in effect.

00800.1-CONTRACT TIME / MILESTONES

1. Anticipated Contract award: March 22, 2018
2. Required Substantial Completion and ready for operational testing and commissioning of the power plant module in Anchorage, Alaska: July 16, 2018
3. Final Completion: August 1, 2018
4. End of Warranty Period and Contractor Release: August 1, 2019

SC-1–DEFINITIONS

A. Add the following definitions:

1. **QUALITY ASSURANCE ACCEPTANCE TESTING –** This is all sampling and testing performed by the CONTRACTOR to determine at what level the product or service will be accepted for payment. Qualified personnel and laboratories will perform sampling and testing. The AUTHORITY pays for this testing.

2. **QUALITY CONTROL PROGRAM (QC PROGRAM) –** The CONTRACTOR'S, Subcontractor's or Supplier's operational techniques and activities that maintain control of the manufacturing process to fulfill the Contract requirements. This may include materials handling, construction procedures, calibration and maintenance of equipment, production process control, material sampling, testing and inspection, and data analysis.

3. **RESIDENT ENGINEER -** The Engineer's authorized representative assigned to make detailed observations relating to contract performance.

SC-2.4–VISITS TO SITE/PLACE OF BUSINESS

At General Conditions Article 2.4, delete the first four words of the first sentence ("The Contracting Officer will …") and replace with the following words "The Contracting Officer has the right to, but is not obligated to…"

SC-4.2–VISIT TO SITE

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

"A. A formal visit to the site will occur as noted on the Invitation to Bid".

SC-4.3–EXPLORATIONS AND REPORTS

At General Conditions Article 4.3, add the following paragraph:

"All reports and other records (if available) are provided for informational purposes only to all plan holders listed with the AUTHORITY as General Contractors, and are available to other planholders upon request. They are made available so Bidders have access to the same information available to the AUTHORITY. The reports and other records are not intended as a substitute for independent investigation, interpretation, or judgment of the Bidder. The AUTHORITY is not responsible for any interpretation or conclusion drawn from its records by the Bidder. 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 supersede or constitute conditions of the Contract Documents."

SC-5.4.1 – INSURANCE REQUIREMENTS

At General Condition Article 5.4.1, delete the second to the last sentence and replace with the following: "The delivery to the AUTHORITY of a written notice in accordance with the policy provisions is required before cancellation of any coverage or reduction in any limits of liability."

SC-5.4.2a – WORKERS COMPENSATION INSURANCE

At General Condition Article 5.4.2a, delete paragraph "a" in its entirety and replace 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. Coverage shall include:

1. Waiver of subrogation against the Authority.

2. Employer's Liability Protection in the amount of $500,000 each accident / $500,000 each disease.

3. 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.

4. 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."

At General Conditions Article 5.4.2 add the following Paragraph:

f. If the Contractor is shipping the Module by barge to Anchorage they must provide Marine Cargo Carriage Insurance for the full value of all materials in transport, including the Alaska Energy Authority provided power plant generator module.

SC-6.13 – SUBCONTRACTORS

Add new general conditions Article 6.13.7 as follows:

"6.13.7 The Contractor may, without penalty, replace a subcontractor who:

1. Fails to comply with the licensing and registration requirements of AS 08.18;
2. Fails to obtain or maintain a valid Alaska Business License;
3. Files for bankruptcy or becomes insolvent;
4. Fails to execute a subcontract or performance of the work for which the subcontractor was listed, and the Contractor has acted in good faith;
5. Fails to obtain bonding acceptable to the AUTHORITY;
6. Fails to obtain insurance acceptable to the AUTHORITY;
7. Fails to perform subcontract work for which the subcontractor was listed;
8. Must be replaced to meet the Contractor's required state or federal affirmative action requirements.
9. Refuses to agree to abide by the Contractor's labor agreement; or
10. Is determined by the AUTHORITY to be not responsible.

In addition to the circumstances described above, a Contractor may in writing request permission from the AUTHORITY to add a new subcontractor or replace a listed subcontractor. The AUTHORITY will approve the request if it determines in writing that allowing the addition or replacement is in the best interest of the state.

The Contractor shall submit a written request to add a new Subcontractor or replace a listed Subcontractor to the Contracting Officer a minimum of five working days prior to the date the new Subcontractor is scheduled to begin work on the construction site. The request must state the basis for the request and include supporting documentation acceptable to the Contracting Officer.

If a Contractor violates this article, the Contracting Officer may:

1. Cancel the Contract after Award without any damages accruing to the AUTHORITY; or
2. After notice and hearing, assess a penalty on the bidder in an amount not exceeding 10

percent of the value of the subcontract at issue.

SC-7.14 – WAGES AND HOURS OF LABOR (Required for only additive alternate one)

Delete 7.14 in its entirety, Davis Bacon Wages are not required for this contract. (for base bid)

SC-7.15 – Overtime Work Hours and Compensation (Required for only additive alternate one)

Delete 7.14 in its entirety, Davis Bacon Wages are not required for this contract. (for base bid)

SC-9.4–CHANGE ORDER

A. At General Conditions Article 9.4, add the following sentence:

"The AUTHORITY will issue Change Orders for the CONTRACTOR to sign. A Change Order shall be considered executed when the AUTHORITY signs it. The CONTRACTOR'S signature indicates that they accept the Change Order or acknowledge it. Acknowledgement of a Change Order does not surrender the CONTRACTOR'S right to claim."

SC-11.8–DELAY DAMAGES

At General Condition Article 11.8, add the following paragraphs:

11.8.1 For each calendar day that the Work is not Substantially Complete after the expiration of the Contract Time or the completion date has passed, the
AUTHORITY shall deduct $1,000 from progress payments.

11.8.2 If no money is due the CONTRACTOR, the AUTHORITY shall have the right to recover these sums from the CONTRACTOR, from the Surety, or from both. These are liquidated damages and not penalties. These charges shall reimburse the AUTHORITY for its additional administrative expenses incurred due to CONTRACTOR'S failure to complete the work within the time specified.

11.8.3 Permitting the CONTRACTOR to continue and finish the work or any part of it after the Contract time has elapsed or the completion date has passed does not waive the AUTHORITY'S rights to collect liquidated damages under this section.

SC-12.1–WARRANTY AND GUARANTEE

At General Condition Article 12.1, add the following sentence:

"The failure of the AUTHORITY to strictly enforce the Contract in one or more instances does not waive its right to do so in other or future instances."

SC-12.6–CORRECTION OR REMOVAL OF DEFECTIVE WORK

At General Condition Article 12.6, add the following paragraphs:

"The CONTRACTOR shall establish necessary lines and grades before performing the Work. Work done before necessary lines and grades are established, Work contrary to the AUTHORITY'S instructions, Work done beyond the limits of the Contract, or any extra Work done without authority, will be considered as unauthorized and shall not be paid for by the AUTHORITY, and may be ordered removed or replaced at no additional cost to the AUTHORITY."

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-15.6– Construction Contract Claim Appeals.

Delete 15.6 in its entirety.

END OF SECTION 00 80 00

REQUIRED CONTRACT PROVISIONS

For

FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the Contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.

3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.

4. A breach of the following clauses of these Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;
Section IV, paragraphs 1, 2, 3, 4, and 7;
Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.

6. Selection of Labor: During the performance of this contract, the contractor shall not:

a. discriminate against labor from any other State, possession, or territory of the United States, or

b. Employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION (Applicable to all Federal-aid construction contracts and to all related subcontracts of $10,000 or more.)

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630 and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the Alaska Energy Authority (AEA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.

b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the AEA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees,

and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)

c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions

by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the AEA and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the AEA.

8. Selection of Subcontractors, Procurement of Materials, and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 26 shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from AEA personnel.

c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

9. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the AEA and the U.S. DOT.

a. The records kept by the contractor shall document the following:

(1) The number of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and

(4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. The contractors will submit an annual report to the AEA each July for the duration of the project, indicating the number of minority, women, and non minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on the job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES (Applicable to all Federal-aid construction contracts and to all related subcontracts of $10,000 or more.)

1. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO Provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

2. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, or national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

3. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to the award of subcontracts or consummation of material supply agreements of $10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGES (Applicable to all Federal-aid construction contracts exceeding $2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.) **(ONLY REQUIRED FOR ADDITIVE ALTERNATE ONE)**

1. General:

a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c] the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also for the purpose of this

Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.

b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.

c. All rulings and interpretations of the Davis-Bacon and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

a. The AEA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

(1) The work to be performed by the additional classification requested is not performed by a classification in the wage determination;

(2) The additional classification is utilized in the area by the construction industry;

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(4) With respect to helpers, when such a classification prevails in the area in which the work is performed.

c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the U.S. Department of Labor, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. Payment of Fringe Benefits:

a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. Apprentices and Trainees (Programs of the U. S. DOL) and Helpers:

a. Apprentices:

(1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

(2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

(3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

(4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

(1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.

(2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate that is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.

(4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers: Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, which is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT): Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding: The AEA shall, upon its own action or upon written request of an authorized representative of the DOL, withhold or cause to be withheld from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the AEA Procurement Officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements: No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such work week unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. Violation: Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible therefor shall be liable to the

affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages: The AEA shall, upon its own action or upon written request of an authorized representative of the U.S. Department of Labor, withhold or cause to be withheld from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS (Applicable to all Federal-aid construction contracts exceeding $2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3): The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1(b) (2) (B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees and ratios and wage rates prescribed in the applicable programs.

c. Each contractor and subcontractor shall furnish each week in which any contract work is performed a payroll of wages paid each of its employees (including apprentices, trainees, and helpers described in Section IV, paragraphs 4 and 5 and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402 or the Government Bookstore, 915 Second Avenue, Seattle, WA 98174. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

d. Each payroll submitted shall be accompanied by a “Statement of Compliance”, signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;

(2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid in full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions set forth in the Regulations, 29 CFR 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.

f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

g. The contractor or subcontractor shall make the records required under paragraph 2b of this section V available for inspection, copying, or transcription by authorized representatives of the AEA, the U.S. DOT, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the AEA, the U.S. DOT, DOL, or all may, after written notice to the contractor , sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORDS OF MATERIALS, SUPPLIES, AND LABOR (Applicable to highway contracts)

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than $1,000,000 (23 CFR Part 635) the contractor shall:

a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.

b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on the Form FHWA-47.

c. Furnish, upon the completion of the contract, to the AEA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.

2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the

amount of any such specialty items so performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR Part 635).

a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph 1 of this Section VII is computed includes the cost of materials and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the AEA contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the AEA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the AEA is assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract, the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the AEA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract entered into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous, or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with

respect to any facts related to the project is a violation of Federal law. Title 18, United States Code, Section 1001, states:

"Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or makes any false, fictitious or fraudulent statements or representations, or makes or uses any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both." (June 25, 1948, ch. 645, 62 Stat. 749.)

To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all personnel concerned with the project:

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT (Applicable to all Federal-aid construction contracts and to all related subcontracts of $100,000 or more.)

By submission of this bid, or the execution of this contract or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub. L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251, et seq., as amended by Pub. L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR Part 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.

3. That the firm shall promptly notify the AEA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.

4. That the firm agrees to include or cause to be included the requirements of paragraphs 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILTY AND VOLUNTARY EXCLUSION

1. Instructions for Certification - Primary Covered Transactions: (Applicable to all Federal-aid contracts - 49 CFR 29)

a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the

prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

d. The prospective primary participant shall provide immediate written notice to the department or agency to which this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.

f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded from Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

Certification Regarding Debarment,
Suspension, Ineligibility and Voluntary
Exclusion—Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and

d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Covered Transactions: (Applicable to all subcontracts, purchase orders and other lower tier transactions of $25,000 or more - 49 CFR 29)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms “covered transaction,” “debarred,” “suspended,” “ineligible,” “primary covered transaction,” “participant,” “person,” “principal,” “proposal,” and “voluntarily excluded,” as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled “Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction,” without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

g. A participation in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies

available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

Certification Regarding Debarment,

Suspension, Ineligibility and Voluntary Exclusion—Lower Tier Covered Transactions:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING (Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

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SECTION 01 11 13

SUMMARY OF WORK

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

A. Related Requirements.

B. Work covered by Contract Documents.

C. Description of Work Items.

D. Contract Method.

E. Work by Others.

F. Shutoffs / Disruptions to Service.

G. CONTRACTOR's Use of Premises.

H. Coordination.

I. Access for Testing and Inspection.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 General Conditions.

B. Section 00 80 00 Supplementary Conditions.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Work under this Contract consists of the construction of the Phase I Power System Power Plant Module for the community of Mertarvik, Alaska.

1. Base Bid: Construct Phase I Power System Power Plant Module: Provide all labor, materials, and equipment required to construct the Phase I Power System Power Plant Module as described in 1.04 Description of Work below, and within the Contract Documents.

2. Additive Alternate. #1: Provide startup and operational testing of the completed power plant module in Mertarvik, Alaska. Provide all

labor, and equipment required to startup and test the power plant module as described in 1.04 Description of Work below, and within the Contract Documents.

1.4 DESCRIPTION OF WORK

Bid Breakdown: Bidders are required to provide a bid breakdown of advisory numbers for the AUTHORITY's allocation of project funding. Breakdown numbers will not be used for purposes of evaluating Bids or Award of the Contract. Bid Breakdown is to follow the format on attached Form for each of the Bid Items as described in 1.04 Description of Work below.

The intent of the Contract is to provide for the construction and completion of every detail of work described in the Contract Documents. The CONTRACTOR shall furnish all labor, materials, supervision, equipment, tools, transportation, quality control, and supplies required to complete the work in accordance with the Contract Documents.

A. Base Bid, Construct Phase I Power System Power Plant Module: Work consists of providing all labor, materials, and equipment required to complete the Mertarvik Phase I Power System Power Plant Module as shown in Section 00 32 00 – Bid Schedule. This work includes but is not limited to, the folowing;

1. Provide a secured construction shop and yard for power plant module fabrication. Provide access to the Authority for progress inspection during normal working hours.
2. Construct power plant module including, but not limited to, the following:
    a. Provide a connex for the generator module of the size and dimensions shown on the plans and described in the contract documents.
    b. Upon commencement of module construction, progress reports shall be provided to the Authority and the Engineer every week. Reports shall include a brief written description and digital photographs of work completed. Adequate photographs shall be provided to document each step in the fabrication procedure. Each report shall be submitted via email within one working day of completion of the workweek.
    c. Provide all structural modifications to the connex including containment floor, penetrations, supports, etc.

Provide wood exterior girts, interior furring and partitions, and doors. Provide interior and exterior coatings.

d. Furnish and install two engine-generators and associated switchgear as specified.
e. Furnish and install all equipment, piping, valves, raceways, conductors, devices, and all other materials as required to provide a complete, fully functional power plant in accordance with the contract drawings and specifications and other related work as described in the Contract Documents. Note that some systems will be installed exterior to the module on-site under a separate contract. Refer to the Drawings for delineation of Work.

3. Module Testing: Contractor to fully test all equipment and systems in the module. Note that testing of the completed module is in addition to specific equipment and system testing required under individual specification sections in the Contract Documents. Activities to complete this task include:
    a. Provide yard space, restroom facilities, electrical service, and access to the Authority to observe operational testing of the completed module (minimum 10-hours of Authority access per day, 8am to 6pm).
    b. Provide diesel fuel as required for testing the system including filling the interior day tank and running the generators. Flush the cooling system with potable water and charge with glycol as specified.
    c. Provide minimum 100 kW electric load bank and a minimum 10,000 BTU/minute radiator to allow full testing of the generators and switchgear. Run through a complete functional test of the generation system including automatic and manual start/stop, paralleling, load sharing, and safety shut downs.
    d. Functionally test all mechanical and electrical equipment and systems.

4. Module Breakdown & Packaging: Contractor to prepare the power plant module for shipment upon completion of testing. Activities to complete this task include:
    a. Drain off excess diesel fuel as required to limit day tank

to 50% full after testing. Drain cooling system, package all glycol in original drums, and secure for shipment inside the module.

b. Break apart mechanical and electrical systems as indicated. Package loose ship items inside module and secure for shipment.

c. Weatherproof module for barge shipment. Seal all openings and penetrations watertight. Provide temporary framing, plywood covers, etc. as required to ensure coverings will remain weatherproof during shipment.

Note that module testing, breakdown, and packaging will occur over a 2-week period beginning from the date the Owner agrees in writing the facility is substantially complete and ready for testing. Note also that module testing, breakdown, and packaging shall be performed within a 50 mile radius of the Authority's office in Anchorage, AK.

5. Module Storage: Activities to complete this task include providing secured storage of the power plant module and exterior bolt on appurtenances for a period of up to 1-month from the final completion date. Any damage that occurs to the module during this period shall be repaired at no expense to the Owner.

Measurement for payment shall be lump sum complete in-place.

B. Additive Alternate #1; Provide startup and operational testing of the completed power plant module in Mertarvik Alaska: Work consists of providing all labor, travel, lodging, meals, and equipment required to startup and test the completed power plant module in Mertarvik, Alaska. Activities to complete this task include:

1. Provide one startup technician on site for a minimum of four days, including travel time, to complete power plant startup and testing.
2. Inspect the completed field installation of the power plant module and associated systems to verify that the module has not been damaged and that the installation is in accordance with the Contract Documents.
3. Repeat the functional testing of the module that was performed prior to breakdown and shipping.
4. Demonstrate and explain operation of all systems to the local utility personnel.

5. Place the power plant on line and observe operation periodically over a minimum 24 hour period.

Contractor shall provide a daily rate for their field technician if additional time is needed on site for testing. All startup and testing activities shall be performed in accordance with the contract drawings and specifications and other related work as described in the Contract Documents.

Measurement for payment shall be lump sum to provide a technician on site for four days of startup and testing activities. Payment for additional days on site shall be based on the contractor's daily rate for their field technician.

C. IMPORTANT NOTES TO CONTRACTOR:

1. Summer time travel to Mertarvik is currently limited to riverboat travel from Newtok to Mertarvik and possible helicopter or bush plane service to Mertarvik. The Newtok Village Council operates a small landing craft that can transfer personnel and small freight between Newtok and Mertarvik at a $200 round trip rate. Fee includes moving freight from the Newtok Airport to the boat and offloading freight at Mertarvik. $130/hr standby rate for boat service. The contractor will need to coordinate with the Newtok Village Council to schedule riverboat travel to and from Newtok and Mertarvik.
2. The Newtok Village Council operates a man camp in Mertarvik during the construction season. Overnight Lodging is available at a $120 rate per night and meals are available at a $70 rate per day. The contractor will need to coordinate with the Newtok Village Council to schedule lodging in Mertarvik.
3. Newtok Village Council contact information:

   Romy Cadiente, Vilage Relocation Coordinator
   907-237-6095
   bunjing2@gmail.com

   Newtok Village Council Construction Project Manager contact information:

   Eric Voorhees, P.E.
   Dowl
   907-562-2000 – Office
   907-865-1225 – Direct
   evoorhees@dowl.com

4. The project manual Technical Specification requirements, tolerances, workmanship, quality, and quality control applies to all Work.

1.3 CONTRACT METHOD

A. This Contract is lump sum and is composed of multiple lump sum items as shown on the Section 00 32 00 – Bid Schedule. This work shall be measured and paid for in accordance with Section 00 70 00 – General Conditions, Article 13 – Payment to Contractors and Completion.

1.4 WORK BY OTHERS

A. Other projects may run concurrently with Work required by this project. Cooperate with other contractors, force account construction crews and superintendents, agencies, and the AUTHORITY to minimize conflicts.

B. Notify the Project Manager immediately if conflicts will interfere with the progress of the work.

1.5 PROTECTION OF EXISTING EQUIPMENT

A. Assume full responsibility for protection and safekeeping of products under this contract.

B. Assume full responsibility for the protection of existing facilities and contents, from damage due to construction operations.

1.6 COORDINATION

A. Coordinate Work to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.

B. Sequence Work to maximize worker efficiency and minimize construction time.

C. Prior to procurement, verify that characteristics of interrelated equipment are compatible.

D. Coordinate space requirements and installation of components. Utilize spaces efficiently to maximize accessibility for other installations, maintenance, and repairs.

1.7 ACCESS FOR TESTING AND INSPECTION

A. Provide access for the AUTHORITY, the Project Manager, and the Engineer to the site. Provide on-site transportation, ladders, lifts, eye and ear protection, hard hats, appropriate and clean respiratory protection, etc. for inspections and testing of the work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

METARVIK PHASE I POWER SYSTEM

POWER PLANT MODULE

BID BREAKDOWN FORM

Bid Item #	**Description**	**Cost**
A.	**BASE BID – CONSTRUCT PHASE I POWER SYSTEM: POWER PLANT MODULE**	
1.	Furnish modified Power Plant Module Connex.	_____
2.	Furnish and install one 180 kW Genset,	_____
3.	Furnish and install one 65 kW Genset.	_____
4.	Furnish and install power plant switchgear.	_____
5.	Furnish and install all module power and control wiring components.	_____
6.	Furnish and install all module ventilation, muffler, fuel, radiators, and coolant system piping and components.	_____
7.	Power plant module start up, testing, commissioning, and packaging prior to shipment to Mertatvik, Alaska.	
	Total Cost - Base Bid	_____
B.	**ADDITIVE ALTERNATE #1 BID – PROVIDE STARTUP AND OPERATIONAL TESTING OF THE COMPLETED POWER PLANT IN MERTARVIK ALASKA**	
1.	Minimum four days onsite power plant startup and testing.	_____
	Total Cost - Add. Alt. #1	_____
	Total Cost - Base Bid and Add. Alt. #1	_____
	Additional onsite daily rate for Add Alt. #1.	_____

SECTION 01 12 19

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. Section 00 10 00 – Information to Bidders.

B. Section 00 43 00 – Subcontractor List.

C. Section 00 70 00 – General Conditions: Subcontractor Certification and Approval.

D. Section 00 80 00 – Supplementary Conditions: Subcontract Provisions.

E. Section 01 33 00 – Submittal Procedures.

1.3 PREPARATION OF CERTIFICATION

A. Certification Forms: Use forms provided by the AUTHORITY.

B. CONTRACTOR shall prepare certification form and submit to the AUTHORITY prior to the start of work. Where required, attach additional information to the certification form.

C. Substitute certification forms will not be considered.

1.4 SUBMITTAL OF CERTIFICATION

A. The CONTRACTOR shall submit certification forms for all subcontractors for review and approval by the AUTHORITY.

1.5 CONSIDERATION OF CERTIFICATION

A. Following receipt of submitted subcontractor certification forms, the AUTHORITY will review for the following, at minimum:

1. Completeness of forms and attachments

2. Proper execution (signatures) of forms and attachments

B. Incomplete or improperly executed subcontractor certification forms will be returned to the CONTRACTOR for revision and resubmittal.

C. The CONTRACTOR shall remove its subcontractor from the project site until its subcontractor certification form is submitted, reviewed, and approved.

D. The AUTHORITY will not process payments for work performed by a non-certified subcontractor.

1.6 ACKNOWLEDGMENT OF CERTIFICATION

A. Submittals which have been examined by the AUTHORITY and are determined to be complete and properly executed shall be acknowledged as such by the Project Engineer's signature.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

ALASKA ENERGY AUTHORITY	SUBCONTRACTOR CERTIFICATION	

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: Mertarvik Phase I Power System Power Plant Module PROJ. #: 18045

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?

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)?

   Contract Minimum Wage Schedule **Yes** ☐ **No** ☐

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** ☐

PROJECT: Mertarvik Phase I Power System, ITB #18045 **PROJ. #:** TBD

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.

Signature: _____

Printed Name: _____

Company: _____

Date: _____

AUTHORITY'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 Approval to reject defective work.

Signature: _____ Date: _____
Project Engineer

The subject subcontract is **NOT APPROVED** for the following reasons:

_____

_____

Signature: _____ Date: _____
Project Engineer

SECTION 01 26 63

CHANGE PROCEDURES

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

A. Section 00 32 00 – Bid Schedule.

B. Section 00 51 00 – Construction Contract.

C. Section 00 70 00 – General Conditions.

D. Section 00 80 00 – Supplementary Conditions: Modifications to General Conditions Section 00 70 00.

E. Section 01 29 73 – Schedule of Values.

F. Section 01 29 76 – Application for Payment.

G. Section 01 32 00 – Work Schedules and Reports.

H. Section 01 73 00 – Execution Requirements.

1.2 SUBMITTALS

A. Submit the 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. Submit with each price proposal a complete, detailed, itemized cost breakdown defining all impacts on Contract Price and Contract Time, in sufficient detail to fully explain the basis for the proposal.

C. All change forms shall be provided by the AUTHORITY.

1.3 CHANGE AUTHORIZATION

A. In accordance with Section 00 70 00 – General Conditions, Part 9 Changes, the AUTHORITY may authorize changes to the Work. The AUTHORITY

may authorize changes in one of the following ways:

1. Directive (Section 00 70 00, Article 9.3).
2. Change Order (CO) (Section 00 70 00, Article 9.4).
3. Acceptance of Shop Drawing variations, which have been identified by the CONTRACTOR. (Section 00 70 00, Article 9.5).
4. Interim Work Authorization (IWA) (Section 00 70 00, Article 9.10).

1.4 CHANGE PROCEDURES

A. The AUTHORITY may initiate change to the contract by issuing to the CONTRACTOR a Request for Proposal (RFP) document. The RFP may include:

1. Change narrative.
2. Supplementary revised drawings, specifications, additional details, or sketches.
3. Other information as deemed appropriate.

B. The CONTRACTOR shall request a change to the contract by submitting to the AUTHORITY a written Change Notice on a form provided by the AUTHORITY. The AUTHORITY may respond by rejecting it, or with a RFP to initiate contract change. The CONTRACTOR'S Change Notice shall include, at minimum:

1. A description of the proposed change with a statement of the justification of the change.
2. Statement of the effect of the change on Contract Price and Contract Time.
3. The information required in Section 00 70 00 – General Conditions, Part 15 Claims for Adjustments and Disputes.

C. Upon receipt of a Request for Proposal (RFP) from the AUTHORITY, the CONTRACTOR shall respond with a price proposal. The CONTRACTOR shall make every effort to return its price proposal in response to the RFP within the time frame requested by the AUTHORITY, but in no event later than 14 calendar days from date the RFP is issued. For work to be performed after the execution of a Change Order or Contingency Authorization, the basis of pricing shall be estimated. For work performed prior to the execution of a Change Order or Contingency Authorization, the pricing shall be based upon documentation of actual incurred costs. The price proposal shall include:

1. A complete, detailed, itemized price breakdown.

2. For the prime contractor and subcontractors, detailed documentation of costs for direct costs, labor, equipment, consultants, sub-contractor markups, overhead and profit, and other items set forth in General Conditions Section 00 70 00, Part 10.
3. Other information as required by the AUTHORITY.

D. Upon receipt of pricing response to a RFP, the AUTHORITY may execute a change to the contract. The issuance of an RFP or the receipt of pricing response to an RFP shall not obligate the AUTHORITY to execute a change to the contract.

1.5 DIRECTIVES

A. The AUTHORITY may issue Directives as per Section 00 70 00 – General Conditions, Article 9.3.

1.6 INTERIM WORK AUTHORIZATIONS (IWA)

A. The AUTHORITY may issue Interim Work Authorizations in accordance with Section 00 70 00 – General Conditions, Article 9.10.

B. IWAs may be issued to authorize the commencement of additional work in advance of the execution of a Change Order or Contingency Authorization.

C. Work authorized by IWA shall be converted to a negotiated Change Order.

D. The price on the IWA form shall be an estimated limit not to be exceeded by the CONTRACTOR without prior amendment of the IWA by the AUTHORITY. The AUTHORITY shall not be obligated to compensate the CONTRACTOR for costs in excess of the amount on the IWA.

E. Upon the execution of an IWA, the CONTRACTOR is authorized to begin the specified work. The CONTRACTOR shall track its costs using Cost of Work procedures. The CONTRACTOR shall use the AUTHORITY's Cost of the Work form and shall submit the data to the AUTHORITY at the close of each work day. A separate Cost of Work form is required for each IWA.

1.7 CHANGE ORDER

A. Any change in Contract Time, Contract Price, or associated responsibility within the general scope of the Contract, shall be made by Change Order.

B. The CONTRACTOR shall use forms furnished by the AUTHORITY for Change Orders.

1.8 CHANGE PRICING AND TIME ANALYSIS

A. Unless specified elsewhere, Section 00 70 00 – General Conditions, Part 10 shall be applied to the negotiation of all changes to the scope of the contract.

1. Unit Price, when unit prices are contained in the Contract.
2. Mutually acceptable Lump Sum Price, including overhead and profit.
3. Cost of the Work.

B. UNIT PRICE CHANGE – For unit price CHANGE PROCEDURES, prices shall be determined by multiplying the contractual unit price(s) by the estimated quantities of Work associated with changed scope. Payment will be based on the actual installed quantities. Document actual installed quantities and submit information requested by the AUTHORITY on a daily basis for its approval and certification. Refer to Section 00 70 00 – General Conditions, Part 10 for additional requirements.

C. LUMP SUM PRICE CHANGE – The CONTRACTOR and the AUTHORITY shall negotiate an equitable price (and time adjustment if appropriate) in good faith. If negotiations do not result in a mutually acceptable lump sum price, the AUTHORITY may, at its discretion, direct the CONTRACTOR to perform the work under Cost of the Work Change Order.

D. COST OF THE WORK CHANGE – The CONTRACTOR shall document Cost of the Work on forms acceptable to the AUTHORITY, and shall submit documented costs to the DEPARTMENT daily for verification and certification. Cost of the Work pricing proposals shall be supported by invoices for substantiation of purchase and rental costs and with additional data as may be requested by AUTHORITY.

E. Time Analysis for CHANGE ORDER PROCEDURES shall be performed as described in Section 01 32 00 – Work Schedules and Reports.

F. The AUTHORITY shall have the right to audit all records in possession of CONTRACTOR relating to activities covered by CONTRACTOR’s pricing of Contract CHANGE ORDER PROCEDURES, including Cost of the Work pricing, as set forth in Section 00700 – General Conditions. If CONTRACTOR is a joint venture, the right of AUTHORITY shall apply collaterally to the same

extent to the records of joint venture sponsor, and of each individual joint venture member.

1.9 FORM EXECUTION

A. Contract forms issued under this section shall be effective the date the AUTHORITY's authorized person signs the form.

B. For Change Orders, CONTRACTOR signature will indicate acceptance of the terms or acknowledgment of order, depending on box checked. Acknowledgment of Change Order does not substitute for notification requirements of Section 00 70 00 – General Conditions, Article 15.1.

1.10 PAYMENT

A. The CONTRACTOR shall promptly revise its Schedule of Values and Application for Payment forms to record each authorized Change Order and each authorized Contingency Authorization as a separate line item. For Change Orders, adjust the Contract Price as shown on the Change Order.

B. The CONTRACTOR shall promptly revise and resubmit its progress schedules to reflect any change in Contract Time, including adjustments for other items of Work affected by the change.

C. Payment for contract changes shall be made only following the execution of Change Orders or Contingency Authorizations and the inclusion of these change documents by reference on the Application for Payment form.

D. Payment shall not be made for Work authorized via Interim Work Authorization.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 29 73

SCHEDULE OF VALUES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Requirements for preparing and submitting the schedule of values.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 – General Conditions.

B. Section 01 11 13 – Summary of Work.

C. Section 01 26 63 – Change Procedures.

D. Section 01 29 76 – Application for Payment.

E. Section 01 32 00 – Work Schedules and Reports.

F. Section 01 33 00 – Submittal Procedures.

G. Section 01 77 00 – Contract Closeout Procedures.

1.3 FORMAT

A. Form and content must be acceptable to AUTHORITY.

B. Form shall have a signature block for submission by CONTRACTOR and a signature block for approval by AUTHORITY.

C. Content shall include the following column headings.

1. CPM Activity Number.
2. CPM Activity Description.
3. CPM Dollar Value.
4. Current Percent Complete.
5. Current Dollar Complete.
6. Previous Percent Complete.
7. Previous Dollar Complete.
8. Percent Complete this Period.
9. Dollar Complete this Period.

1.4 CONTENT

A. List installed value of each activity shown on the submitted and approved CPM Schedule.

B. For items on which payments will be requested for stored products, list sub values for cost of stored products with taxes paid.

C. Limits for specific line item values shall be as specified below and shall be included on all approved Schedules of Values and Applications for Payment.

1. Mobilization and Demobilization: Unless specified elsewhere, the assigned values for mobilization and demobilization shall be based upon the estimated value of specified Work for each of these tasks.
2. Contract Closeout Procedures: Unless specified elsewhere, the assigned values for tasks specified under Contract Closeout Procedures shall be based upon the estimated value of each task. The breakdown shall include separate amounts for the requirements of Final Completion and Final Acceptance, as set forth below:

Contract Price	Value for Final Completion	Value for Final Acceptance
Less than $200,000	$2,000	$2,000
$200,000 - $500,000	$5,000	$5,000
$500,001 - $1,000,000	$10,000	$10,000
$1,000,001 - $5,000,000	$20,000	$20,000
Greater than $5,000,000	$30,000	$30,000

D. The sum of values listed on the Schedule of Values shall equal total Contract Price.

E. A Schedule of Values containing costs for early activities in excess of actual value (“front end loading”) will be rejected by the AUTHORITY until the CONTRACTOR corrects the deficiency. The AUTHORITY shall not be obligated to pay the CONTRACTOR until front end loading is eliminated and the Schedule of Values is approved.

1.5 SUBMITTAL

A. Submit proposed Schedule of Values with updated CPM Schedule per specification sections for Summary of Work, Work Schedules and Reports, and Submittals.

B. Submit Schedule of Values with updated completion percentages sufficiently in advance of each Application for Payment to enable the AUTHORITY to resolve

differences.

1.6 SUBSTANTIATING DATA

A. When the AUTHORITY requires substantiating information, submit data justifying line item amounts in question.

B. 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.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 29 76

APPLICATION FOR PAYMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Procedures for preparation and submittal of Application for Payment.

1.2 RELATED REQUIREMENTS

A. Section 00 32 00 – Bid Schedule.

B. Section 00 70 00 – General Conditions.

C. Section 00 80 00 – Supplementary Conditions.

D. Section 01 11 13 – Summary of Work.

E. Section 01 26 63 – Change Procedures.

F. Section 01 29 73 – Schedule of Values.

G. Section 01 32 00 – Work Schedules and Reports.

H. Section 01 33 00 – Submittal Procedures.

I. Section 01 45 00 – Quality Control.

J. Section 01 51 00 – Construction Facilities.

K. Section 01 77 00 – Contract Closeout Procedures.

L. Section 01 78 39 – Project Record Documents.

1.3 FORMAT

A. Submit Application for Payment on form approved by the AUTHORITY.

1.4 PREPARATION OF APPLICATIONS

A. Type required information on Application for Payment form acceptable to the AUTHORITY.

B. Execute certification by original signature of authorized officer upon each copy of the Application for Payment.

C. Show breakdown of costs for each item of the Work on accepted Schedule of Values as specified in Section 01 29 73 – Schedule of Values.

D. 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.

E. Submit Stored Materials Worksheet with every Application for Payment requesting payment for stored materials. Show only direct costs of materials and freight. Submit documentation in accordance with Section 00 70 00 – General Conditions, Article 13.5 Stored Materials and Equipment, for materials shown in column titled "New Material This Pay Request Period."

1.5 SUBMITTAL PROCEDURES

A. Submit two originals of each Application for Payment at one-month intervals. Each document shall bear original signature of authorized executive.

B. Submit with AUTHORITY-approved transmittal letter bearing AUTHORITY's project number.

1.6 SUBSTANTIATING DATA

A. When AUTHORITY requires substantiating information, submit all requested data justifying line item amounts in question.

B. Provide one copy of data with cover letter for each copy of Application for Payment. Show Application for Payment number and date, and line item by number and description.

1.7 SUBMITTALS WITH APPLICATION FOR PAYMENT

A. Submit the following for review sufficiently in advance of Application for Payment to allow detailed review by AUTHORITY and resolution of differences.

1. Schedule of Values with updated percentages of completion as required by Section 01 29 73 – Schedule of Values.

B. Submit the following with each Application for Payment.

1. Updated construction schedule as required by Section 01 32 00 – Work Schedules and Reports.
2. Updated Project Record Documents as required by Section 01 78 39 – Project Record Documents.
3. Letter certifying that all Project Record Documents, including as-built drawings and submittals are current.

1.8 ADDITIONAL REQUIREMENTS FOR FIRST APPLICATION FOR PAYMENT

A. The first Application for Payment will be processed after the Resident Engineer has received all of the following:

1. Superintendent Data (Section 00 70 00 – General Conditions, Article 6.2).
2. Progress Schedule (Section 00 70 00 – General Conditions, Paragraph 6.6.1, & Section 01 32 00 – Work Schedules and Reports).
3. Schedule of Values (Section 00 70 00 – General Conditions, Paragraph 6.6.2,
& Section 01 29 73 – Schedule of Values).
4. Submittal Schedule (Section 00 70 00 – General Conditions, Paragraph 6.6.2).
5. Safety Representative Designation (Section 00 70 00 – General Conditions, Article 6.18).
6. Building Permits (Section 00 70 00 – General Conditions, Article 7.2).
7. Name of Individual Authorized to Accept Changes (Section 01 26 63 – Change Procedures).
8. CONTRACTOR Quality Control Program and Plan (Section 01 45 00 – Quality Control).
9. Freeze Protection Plan (Section 01 51 00 – Construction Facilities).

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 19

PROJECT MEETINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Requirements for various meetings during the construction project.

1.2 RELATED REQUIREMENTS

A. Section 01 11 13 – Summary of Work.

B. Section 01 32 00 – Work Schedules and Reports.

C. Section 01 33 23 – Shop Drawings, Product Data, and Samples.

D. Section 01 45 00 – Quality Control.

E. Section 01 73 00 – Execution Requirements.

1.3 PRECONSTRUCTION CONFERENCES

A. AUTHORITY will administer preconstruction conference for execution of Contract and exchange of preliminary submittals. Attendance by all key CONTRACTOR and Subcontractor project personnel is required. The CONTRACTOR shall notify and invite in writing to the pre-construction conference all serving utilities at least 72 hours in advance of the conference.

B. AUTHORITY may administer site mobilization conference at Project site for clarification of CONTRACTOR responsibilities in use of site and for review of administrative procedures.

C. AUTHORITY will document the meeting and distribute minutes within 48-hours of adjournment. Minutes will be typed, reflecting date, list of attendees and in format to facilitate correction of previous meeting minutes. Distribution will be to all attendees and those affected by discussions or decisions made at meeting.

1.4 PREINSTALLATION CONFERENCES

A. When required in an individual specification section, and as shown in the CONTRACTOR's quality control plan, or as directed by the AUTHORITY, convene a pre-installation conference prior to commencing Work for a specific item.

B. Require attendance of entities directly affecting, or affected by, Work of the section.

C. Review conditions of installation, preparation and installation procedures, and coordination with related Work.

D. Record significant discussions and agreements and disagreements of each conference, and approved schedule. Distribute record of conference to all attendees within 24-hours of adjournment.

1.5 PROGRESS MEETINGS

A. The CONTRACTOR shall attend Progress Meetings when scheduled by the Project Manager or requested by the CONTRACTOR. Progress Meetings will be held on a day and time which is mutually convenient to both the AUTHORITY and the CONTRACTOR. These meetings shall be documented by the CONTRACTOR as well as the Project Manager.

B. Progress Meeting shall be attended by all key CONTRACTOR personnel and, as appropriate, Subcontractor project personnel.

C. The CONTRACTOR shall furnish copies of its current Two Week Look Ahead Schedule, per Section 01 32 00 – Work Schedules and Reports, to all attendees of the meeting. This schedule will be reviewed in detail during the meeting and will be used for the coordination of activities by others.

D. Progress Meetings will also be used to review other key aspects of the Work, such as safety, quality, critical items, etc.

E. Meeting Minutes: The CONTRACTOR shall document the meetings and distribute minutes within 48-hours of adjournment. Minutes shall be typed, reflecting date, attendees followed by company or organization, who stated each item, and in format to facilitate correction of previous meeting minutes. Distribution shall be to all attendees and those affected by discussions or decisions made at meeting.

1.6 SAFETY MEETING

A. The CONTRACTOR shall conduct Safety Meetings as required by its project Safety Program.

B. The CONTRACTOR shall invite the AUTHORITY to attend Safety Meetings.

1.7 OTHER MEETINGS

A. At various times throughout the duration of the Contract, the CONTRACTOR will be required to attend meetings as requested by the AUTHORITY. It is anticipated that such meetings will involve coordination with others, project schedule review, problem resolution, change order negotiations, and other topics of mutual importance.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 00

WORK SCHEDULES AND REPORTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Requirements for the preparation and maintenance of the construction CPM schedule, recovery schedules, time impact evaluation, monthly project status reports, two week look-ahead schedules, and weekly construction reports.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 – General Conditions.

B. Section 00 80 00 – Supplementary Conditions.

C. Section 01 11 13 – Summary of Work.

D. Section 01 26 63 – Change Procedures.

E. Section 01 29 73 – Schedule of Values.

F. Section 01 29 76 – Application for Payment.

G. Section 01 31 19 – Project Meetings.

H. Section 01 33 00 – Submittal Procedures.

1.3 SUMMARY

A. Scheduling of Work under this Contract shall be performed by CONTRACTOR in accordance with the requirements of this Section.

B. CPM Schedule shall be based upon, and incorporate, Contract milestone and completion dates as specified in Section 00 80 00, Supplementary Conditions, and Section 01 11 13 – Summary of Work.

C. Definitions:

1. Project Schedule – The schedule prepared or updated by the CONTRACTOR to the requirements specified herein. The project schedule shall be used to measure the progress of the work and aid in the evaluation of time impacts to the project.
2. Anticipated CPM Schedule – The schedule prepared by the CONTRACTOR defining the planned work in the first 90 calendar days of the contract.
3. Finalized CPM Schedule – The baseline schedule prepared by the CONTRACTOR that shows the sequence and dates in which the CONTRACTOR proposes to perform the work. Once approved, it becomes the basis upon which the CONTRACTOR performs periodic schedule updates.
4. Periodic Schedule Updates – Progress updates to the approved project schedule, shall occur monthly prior to, and included with, each pay application.
5. Time Impact Evaluation (TIE) – Forward looking schedule analysis technique that adds a modeled delay to an accepted contract schedule to determine the possible impact of that delay to the project completion.
6. Fragnet – A sequence of new activities that are proposed to be added to project schedule to demonstrate the influence of the delay or impact to the project's contractual dates. A Fragnet is created using a 'Reflection' of the approved project schedule that immediately preceded the delay.

D. Required Schedules:

1. Anticipated CPM Schedule – Submit the Anticipated CPM Schedule, defining the CONTRACTOR's planned operations for the first 90 Calendar days after Notice-to-Proceed, for approval within 15 Calendar days after the NTP is acknowledged, or at the preconstruction conference, whichever comes first. The Anticipated CPM Schedule forms the basis for the Finalized CPM Schedule specified herein, and must include all of the required Plan and Program preparations, submissions, and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, Environmental Protection Plan, etc.). The AUTHORITY and CONTRACTOR shall meet to discuss the Anticipated CPM Schedule within 10 working days after its

submittal. The CONTRACTOR shall make corrections to the schedule necessary to comply with Contract requirements and shall adjust the schedule to incorporate any missing information requested by the AUTHORITY. The CONTRACTOR shall resubmit the Anticipated CPM Schedule if requested by AUTHORITY.

2. Finalized CPM Schedule – Submit the Finalized CPM Schedule for approval within 60 Calendar days after NTP. The schedule shall demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. In accordance with Section 00 70 00 – General Conditions, the Finalized CPM Schedule shall be submitted prior to the first progress payment. The AUTHORITY's review and approval of the Finalized CPM schedule shall be a prerequisite to the application for the second progress payment. The Finalized CPM Schedule shall be at a reasonable level of detail as determined by the AUTHORITY.
3. Monthly Updates and Status Reports.
4. Revision, Time Impact Evaluation (TIE), and Recovery Schedules.
5. Record Drawing Schedule.

E. Failure of the CONTRACTOR to meet the requirements of this specification may result in the disapproval of the Anticipated, Interim, Finalized, or Periodic Schedule Updates. In the event that the AUTHORITY directs schedule revisions, and those revisions have not been included in subsequent project schedule revisions or updates, the Contracting Officer may not pay for the applicable activities until such revisions to the project schedule have been made.

F. Basis for Payment and Cost Loading – Inspections of work progress shall be the basis for determining contract earnings during each update period and therefore the amount of each progress payment. The schedule shall be updated to reflect the outcome of these inspections. Activity cost loading shall be reasonable, as determined by the AUTHORITY. Front loading activities will not be allowed.

G. Schedules and Reports shall be submitted as specified in Sections 01 33 00 – Submittal Procedures.

H. CPM Schedule shall be the basis for Two Week Look Ahead Schedule presentation at Progress Meetings as specified in Section 01 31 19 – Project Meetings.

1.4 GENERAL REQUIREMENTS

A. Develop the Project Schedule to an appropriate level of detail, as determined by the AUTHORITY. Failure to develop the Project Schedule to the appropriate level of detail will result in its disapproval. Inaccuracy and/or the omission of any element of the Work by the CONTRACTOR will not relieve the CONTRACTOR of the responsibility for accomplishing the Work, in accordance with Contract

Documents. The AUTHORITY's acceptance of the schedule shall be for its use in monitoring and evaluating job progress, payment requests, time extension requests, and the like; and shall not, in any manner, impose a duty of care upon the AUTHORITY; nor act to relieve the CONTRACTOR of its responsibility for the means and methods of construction. The AUTHORITY will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:

1. Activity Durations – Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. No construction activity shall have Original Durations greater than one month's worth of work (20 working days or 30 calendar days).
2. Permit Activities – Include permit activities with the necessary submission dates.
3. Procurement Activities – Include activities associated with the submittal, approval, procurement, fabrication and delivery; of critical materials, equipment, fabricated assemblies and supplies. This will include all procurement activities that will have a direct impact on construction activities. Additionally, include activities on all long lead materials, equipment, fabricated assemblies and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 30 calendar days. These activities shall be logically tied to the submission and approval of product info/shop drawings, and the related construction installation activity.
4. Mandatory Task – The following activities, if applicable, shall be included in the initial project schedule and all updates. The CONTRACTOR shall be responsible for all impacts resulting from resubmittal of shop drawings and submittals.

a. Long material procurement activities.
b. Submission and approval of mechanical, structural, and electrical materials and equipment.
c. Submission and approval of O&M Manuals.
d. Submission and approval of Record Drawings.
e. Request for Substantial Completion Inspection as specified in 01 77 00 – Contract Closeout Procedures.
f. Performance Verification Testing.
g. Other systems testing, as specified.
h. Demonstration and Training.
i. Final Cleaning.
j. Substantial Completion Inspection.
k. Substantial Completion.
l. Final Completion Inspection.
m. Final Completion.

5. AUTHORITY Activities – Show AUTHORITY activities that could impact progress. These activities include commissioning of AUTHORITY furnished equipment (i.e. modular power plant). Unless otherwise agreed upon by CONTRACTOR and AUTHORITY, AUTHORITY activities shall be have an originally scheduled duration of 30 days.
6. Work Break-down Structure (WBS) – The project schedule shall be organized using WBS. (This is separate from, and in addition to, the use of Activity Codes; which are addressed below). The WBS shall include all major elements of the scope of work including, but not limited to, the following elements:

a. Milestones
b. Submittals
c. Approvals
d. Procurement
e. Construction
f. Commissioning/Testing/Start-up
g. Close-out Submittals
h. Close-out Approvals
i. Inspections

7. Activity Coding – All Activity Codes shall be developed and

assigned to activities as detailed herein. Some Activity Codes may not be used, but only at AUTHORITY's discretion.

RESP	Responsible Party (e.g. Prime CONTRACTOR, Subcontractor, AUTHORITY)
AREA	Area of Work
PHAS	Phase of Work
MODF	Modification to Contract
CATW	Category of Work
FOW	Feature of Work

a. RESP Responsible Party – Assign responsibility code for all activities to the Prime CONTRACTOR, Subcontractor, or AUTHORITY who is responsible for performing the activity. The list of activities to be coded with AUTHORITY Responsibility include, but is not limited to, AUTHORITY approvals, AUTHORITY furnished property/equipment, and Notice to Proceed (NTP). Code all activities not coded to the AUTHORITY to the Prime CONTRACTOR or Subcontractor responsible to perform the work. Activities shall not have more than one Responsibility Code. Codes should be descriptive of the scope of work, for example ELEC (for electrical Subcontractor), MECH (for mechanical Subcontractor), PRIM for Prime CONTRACTOR, and AUTH (for AUTHORITY activities).

b. AREA (Area of Work) – Assign Work Area code to activities based upon the work area in which the activity occurs. Define work areas based upon resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include the power plant, bulk tank farm, electrical distribution, site work, etc. Activities shall not have more than one Work Area Code. Not all activities are required to be Work Area coded. A lack of Work Area coding will indicate the work area is not resource or space constrained.

c. PHAS Phase of Work Coding – Assign Phase of Work code to all construction activities if the work has a separately defined performance periods. Identify a Phase

Code to allow filtering and organizing the schedule accordingly. Each activity shall have only one Phase of Work code.

d. MODF Modification of Contract – Assign a Modification of Contract code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, after approval by AUTHORITY. An activity can have only one Modification of Contract code.

e. CATW Category of Work – Assign a Category of Work code to all activities. Category of Work codes include, but are not limited to, milestone, submittal, approval, procurement, permit, installation, weather sensitive installation, commissioning/testing, inspection, contract closeout. Each activity shall have only one Category of Work Code.

f. FOW Feature of Work – Assign a Feature of Work code to all construction activities based upon the definable feature of work to which the activity belongs.

B. Project Schedule Submissions – Provide the submissions as described below.

1. Periodic Schedule Updates:

a. As a minimum the CONTRACTOR shall update the project schedule on a monthly basis. These submissions will enable the AUTHORITY to assess CONTRACTOR's progress. If the CONTRACTOR fails or refuses to furnish the information and schedule updates as set forth herein, then the CONTRACTOR shall be deemed not to have provided an estimate upon which a progress payment can be made.

b. Neither updating, changing or revising of any report, schedule or narrative submitted to the AUTHORITY by the CONTRACTOR under this Contract, nor the AUTHORITY's review or acceptance of any such report, schedule or narrative shall have the effect of amending or modifying, in any way, the Contract Substantial Completion date or milestone dates or of modifying or limiting, in any way, the CONTRACTOR’s obligations under this Contract.

2. Submittal Requirements – Each submittal shall have as its face document a completed AUTHORITY-furnished submittal summary form. Submittals received from sources other than the CONTRACTOR will be returned to the CONTRACTOR without the AUTHORITY's review. Submit the following items for the Anticipated CPM, Interim CPM, Finalized CPM, and every Periodic Schedule Update throughout the life of the project:

   a. Narrative Report – Provide a Narrative Report with each schedule submission. The narrative report is expected to communicate to the AUTHORITY the CONTRACTOR's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis. The Narrative Report shall include the following information as a minimum:

      i. Project number, Date, Update Number.
      ii. Critical Path - Show all activities on the critical path. The critical path is defined as the longest path of logic.
      iii. Added Activities - Include Activity ID, Activity Name, Original Duration, Calendar, Predecessor(s), Successor(s), AREA, PHAS, CATW, FOW, and MODF codes.
      iv. Deleted Activities.
      v. Duration Changes.
      vi. Calendar Changes.
      vii. SOV Changes.
      viii. Current and Anticipated Delays – Include a description of current and anticipated problem areas, impacts, whether it/they are the responsibility of the AUTHORITY or CONTRACTOR, and an explanation of corrective actions taken or required to be taken.
      ix. Scheduler Comments – Explain in narrative form, anything the AUTHORITY should know or understand as to the reasons for the changes contained herein.

b. Network Diagram Report – The network diagram report is required for the Anticipated, Interim, Finalized, and all Periodic Updates. 11”x17” color copies of the Network Diagram Report shall be provided. Include the following columns:

i. Activity ID
ii. Activity Name
iii. Original Duration
iv. Remaining Duration
v. Start
vi. Late Start
vii. Finish
viii. Late Finish
ix. Percent Complete
x. Total Float

3. Update Submission Following Progress Meeting – Submit a complete update of the project schedule containing all approved progress, revisions, and adjustments not later than 4 working days after Progress Meeting.

C. Progress Meetings – The CONTRACTOR shall meet with the AUTHORITY (or as otherwise mutually agreed to) for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress, and to review planned activities for the upcoming two weeks. The current approved schedule update shall be used for the purposes of this meeting. Progress meetings will address the status of RFI's, RFP's and Submittals. CONTRACTOR shall provide and present a time scaled two-week look ahead schedule that is based and correlated to the current CPM schedule. The schedule shall look out two weeks from the day of the Progress Meeting.

D. Subcontractor Agreement – Submit for each Subcontractor and supplier on their corporate letterhead, a statement certifying that the Subcontractor or supplier accepts the CONTRACTOR’s Finalized CPM Schedule, and that the Subcontractors’ or suppliers’ related schedules have been properly incorporated. The certification statements shall confirm that task durations and resource have been correctly included in the Finalized CPM schedule.

E. Weekly Construction Reports – The CONTRACTOR shall, on a

weekly basis, submit a task report to the AUTHORITY for each work week, including weekends and holidays, when work occurred on the project. The CONTRACTOR shall develop the weekly construction reports, in Microsoft Work or Excel format, including manpower and labor hours by the CONTRACTOR, Subcontractor, Area, Change Order, etc. Upon request of the AUTHORITY, the CONTRACTOR shall furnish electronic file(s) or the reports which are easily sortable by week ending date. The CONTRACTOR shall obtain the AUTHORITY's approval of weekly construction report format prior to implementation. The following shall be included in report:

1. Project name and Project number.
2. CONTRACTOR's name and address.
3. Weather, temperature and any unusual site conditions.
4. Was this week adversely affected by the weather?
5. Brief description, location, and pictures of the week's scheduled activities and any special problems and accidents, including Work implemented by Subcontractors.
6. Activities Started this week.
7. Activities Completed this week.
8. Equipment, other than hand tools, utilized by CONTRACTOR and Subcontractors. Include equipment identification, number of hours in service, and number of hours idle. Include any equipment inspections and equipment maintenance performed, if any.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Procedures for the preparation, tracking, and review of submittals for the project.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 – General Requirements.

B. Section 00 80 00 – Supplementary Conditions.

C. Section 01 11 13 – Summary of Work.

D. Section 01 12 19 – Contractor's Certification of Subcontracts.

E. Section 01 29 73 – Schedule of Values.

F. Section 01 29 76 – Applications for Payment.

G. Section 01 32 00 – Work Schedules and Reports.

H. Section 01 33 23 – Shop Drawings, Product Data, and Samples.

I. Section 01 45 00 – Quality Control.

J. Section 01 60 00 – Material and Equipment.

K. Section 01 73 00 – Execution Requirements.

L. Section 01 77 00 – Contract Closeout Procedures.

M. Technical Product Specifications.

N. Operations and Maintenance Manuals.

O. Equipment Installation Data.

1.3 SCHEDULE OF SUBMITTALS

A. Submit preliminary Schedule of Submittals as required by Section 00 70 00 – General Conditions in the first 30 calendar days of the contract. In addition to manufacturers data and shop drawing submissions, include all submittals required by the Contract Documents in the Schedule of Submittals.

B. Schedule of Submittals will be used by the AUTHORITY to schedule time in their activities relating to review of submittals. Schedule of Submittals shall portray an orderly sequence of submittals, early submittals for long lead-time items, and submittals which require extensive review.

C. Schedule of Submittals shall be reviewed by the AUTHORITY and shall be revised and resubmitted until accepted by the AUTHORITY.

1.4 CONTRACTOR REVIEW

A. The CONTRACTOR shall prepare and review submittals as required by the provisions of Section 00 70 00 – General Conditions and Section 00 80 00 – Supplementary Conditions.

1.5 SUBMITTAL REQUIREMENTS

A. Number of copies: Submit the number of copies of submittals which the CONTRACTOR requires to be returned to it following review, plus four (4) copies for retention by the AUTHORITY. Provide electronic portable document format (PDF) file of each submittal.

B. Submit each submittal with a Submittal Summary form as its face document. Use a Submittal Summary form provided by the AUTHORITY, or a substitute approved by the AUTHORITY.

C. Label submittals with a numbering system approved by the AUTHORITY. Identify the project by title and AUTHORITY'S project number; identify Work and product by Specification section and Article number.

D. Submit items required by individual specification sections together. Do not mix items specified in different sections in the same submittal. Sequence the submission of submittals to correspond with the approved Schedule of Submittals.

E. Before the submission of each submittal, 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 submittal with other submittals and with the requirements of the Work and the Contract Documents, upon which the CONTRACTOR shall certify in writing on each submittal that it has made this determination. The failure to review and certify a submittal shall be cause for the AUTHORITY to return the submittal without review.

F. On the submittal, notify the AUTHORITY in writing of any deviations from requirements of the Contract Documents.

G. Organize the submittals into logical groupings to facilitate the processing of related submittals, such as:

1. By Specification Section number. Sequentially number each submittal. Resubmittals shall be identified with the original submittal number followed by a sequential alphabetic suffix.
2. Finishes which involve AUTHORITY selection of colors, textures, or patterns.
3. Items required by the individual Technical Product Specification Sections.
4. Associated items, which require correlation for efficient function or for installation.

H. Submit all required color and finish samples in order to receive approval for colors and finishes.

1.6 RESUBMITTALS

A. Provide the same number of submittals required for the first submission. For example, if 6 are required and 2 are returned marked “rejected” or “revise and resubmit”, re-submit 6 copies. The AUTHORITY will not return any of its copies from the prior submittal for the CONTRACTOR’S use in preparing the re-submittal.

B. Provide complete copies of re-submittals. Do not re-submit partial copies of submittals for incorporation into the AUTHORITY’S retained submittals from the prior submission.

C. If drawings, product submittals, samples, mockups, or other required submittals

are incomplete or not properly submitted, the AUTHORITY will not review the submittal and will return it to the CONTRACTOR. The AUTHORITY will review a submittal no more than 2 times without additional charge to the CONTRACTOR (incomplete or improperly submitted submittals count as one of these submittals). The CONTRACTOR shall pay all review costs associated with more than 2 reviews.

1.7 AUTHORITY REVIEW

A. The AUTHORITY will review submittals and re-submittals, and return submittal comments within 30 calendar days of receipt.

B. The AUTHORITY or authorized agent will receive, review and return submittals to the CONTRACTOR with one of the following dispositions noted:

"No Exceptions Taken" – denotes that the submittal is generally consistent with the requirements of the Contract Documents. A resubmittal is not required.

"Make Corrections Noted" – denotes that the submittal is generally consistent with the requirements of the Contract Documents but only as conditioned by notes and corrections made on the submittal. A resubmittal is not required provided the CONTRACTOR understands the review comments and desires no further clarification.

"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. The AUTHORITY will indicate on the returned submittal what revisions are necessary. A resubmittal is required.

"Rejected" – denotes that the submittal does not meet the requirements of the Contract Documents and shall not be used in the Work. The AUTHORITY will indicate on the returned submittal the reasons for its rejection. A resubmittal is required.

C. Review by the AUTHORITY of submittals 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 submittals shall not relieve the CONTRACTOR of the responsibility for compliance with the requirements of the Contract Documents or for errors, dimensions, and quantities unless specific exception is requested and approved on the submittal.

D. The AUTHORITY's review shall not extend to the means, methods, techniques, sequences or procedures of construction or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

1.8 DISTRIBUTION

A. The CONTRACTOR shall be responsible for making and distributing any reproductions of approved submittals that it may require for its use.

B. The CONTRACTOR shall perform work in accordance with approved submittals.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 33 23

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

A. Section 00 70 00 – General Conditions.

B. Section 01 11 13 – Summary of Work.

C. Section 01 31 19 – Project Meetings.

D. Section 01 33 00 – Submittal Procedures.

E. Section 01 45 00 – Quality Control.

F. Section 01 60 00 – Material and Equipment.

G. Section 01 73 00 – Execution Requirements.

H. Section 01 78 39 – Project Record Documents.

I. Technical Specifications: Identification of submittal requirements.

1.2 SHOP DRAWINGS

A. Present in a clear and thorough manner. Label each Shop Drawing with AUTHORITY's Project name, Project number and date of submittal. Identify each element of the Shop Drawings by reference to specification section, sheet number and detail, schedule, or Area of Work.

B. The data shown on the Shop Drawings shall be complete with respect to specified performance and design criteria, materials and similar data to show the AUTHORITY materials and equipment the CONTRACTOR proposes to provide.

C. Identify dimensions; show relation to adjacent or critical features or Work or products.

D. Designation of work “by others”, if shown in submittals, shall mean that work will be responsibility of CONTRACTOR rather than subcontractor or supplier who has prepared submittals.

E. Minimum Sheet Size: 11"x17".

1.3 PRODUCT DATA

A. 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, piping and control diagrams; component parts; finishes; dimensions; and required clearances.

B. 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. Submit manufacturer's instructions for storage, preparation, assembly, installation, start-up, adjusting, commissioning, and finishing.

1.4 SAMPLES

A. Submit full range of manufacturer's standard finishes except when more restrictive requirements are specified, indicating colors, textures and patterns for AUTHORITY selection as specified in technical product sections.

B. Submit samples to illustrate functional characteristics of products, including parts and attachments.

C. Approved samples which may be used in the Work are indicated in the Specification section.

D. Samples shall be identified clearly as to material, supplier, pertinent data such as catalog numbers and the use for which they are intended, and otherwise as the AUTHORITY may require, to enable the AUTHORITY to review the submittal.

E. Label each sample with identification required for transmittal letter.

F. Provide field sample mockup of finishes at Project, at location acceptable to AUTHORITY, as required by individual Specification section. Install each sample complete and finished. Acceptable finishes in place may be retained in completed Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 42 19

REFERENCE STANDARDS

PART 1 GENERAL

1.1 RELATED SECTION

A. Section 00 70 00 – General Conditions.

1.2 QUALITY ASSURANCE

A. For Products or workmanship specified by association, trade, or other technical standards: comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date of bid advertisement, unless otherwise stated in the Contract Documents.

C. Provide copies of standards through the submittal process when required by the Contract Documents. Maintain a copy of each reference standard on site during construction.

D. Should specified reference standards conflict with Contract Documents, request clarification from the AUTHORITY before proceeding. Local code requirements, where more stringent than referenced standards, shall govern.

E. Neither the contractual relationship, duties, nor responsibilities of the parties to the Contract, nor those of the Architect/Engineer, shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

1.3 CODES, STANDARDS, AND REGULATORY REQUIREMENTS

A. All work shall be in accordance with the latest edition of governing Codes, Standards and regulatory requirements, including but are not limited to:

1. International Fire Code (IFC).
2. National Fire Protection Association (NFPA) NFPA 30.
3. International Building Code (IBC).
4. National Electrical Code (NEC).
5. American National Standards Institute/American Society of Mechanical

Engineers (ANSI/ASME).

6. American Petroleum Institute (API).
7. American Society of Testing and Materials (ASTM).
8. American Society of Mechanical Engineers (ASME).
9. American Welding Society (AWS).
10. American Institute of Steel Construction (AISC).
11. Manufacturers Standardization Society of the Valve and Fitting Industry (MSS).
12. Alaska Department of Environmental Conservation (ADEC) 18 AAC 75.
13. Steel Structures Painting Council (SSPC).
14. Occupational Safety and Health Administration (OSHA) 29 CFR 1910.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 45 00

QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Quality Control program requirements.

B. Manufacturer field services requirements.

C. Testing laboratory requirements.

D. Record keeping for quality control.

E. Quality surveillance by the AUTHORITY.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 – General Conditions.

B. Section 01 29 76 – Application for Payment.

C. Section 01 31 19 – Project Meetings.

D. Section 01 33 00 – Submittal Procedures.

E. Section 01 33 23 – Shop Drawings, Product Data, and Samples.

F. Section 01 42 19 – Reference Standards.

G. Section 01 60 00 – Material and Equipment.

H. Section 01 77 00 – Contract Closeout Procedures.

I. Individual Specification Sections: Quality Control.

1.3 REFERENCES

A. Comply with Section 01 42 19 – Reference Standards and the individual technical product specification sections.

1.4 DESCRIPTION

A. The CONTRACTOR shall provide and maintain an effective Quality Control Program related to testing and inspection. The CONTRACTOR shall perform Quality Control Testing as specified and shall provide copies of all results to the AUTHORITY for use in observing contract compliance.

B. The CONTRACTOR's Quality Control Program shall include, but is not limited to: administration, management, supervision, reports, record-keeping, submittals, services of independent testing agencies and labs, and other related services.

C. Quality Control is the sole responsibility of the CONTRACTOR.

D. The CONTRACTOR's Quality Control program includes International Building Code (IBC) required Special Inspection.

1. Special inspection is required in accordance with IBC Section 1704. The CONTRACTOR shall engage the services of an independent, qualified Special Inspector who meets all IBC requirements. The following items require Special Inspection:

    a. Periodic inspection and testing of structural bolted connections.
    b. Periodic inspection of field and factory single pass fillet welds less than 5/16".
    c. Continuous inspection of all other field and factory welding.

2. Special inspection is in addition to the CONTRACTOR's required quality control inspections and testing. The CONTRACTOR's quality control inspections and testing shall occur prior to Special Inspection, and the Quality Control Reports shall be available to the Special Inspector.
3. Periodic structural observation is required in accordance with IBC Section 1709.

E. Quality Control services are required to verify compliance with requirements specified or indicated and do not relieve the CONTRACTOR of responsibility for compliance with the Contract Documents.

F. Specific Quality Control requirements for individual construction fabrication and procurement activities are included in the Technical Product Specifications. General Quality Control requirements entail ensuring that all aspects of the Work conform to the technical requirements of the Contract Documents.

G. The CONTRACTOR's Quality Control Program described herein is not intended to limit the CONTRACTOR's Quality Control activities, which may be necessary to achieve compliance with the Contract Documents.

H. The CONTRACTOR shall have a full-time Quality Control Manager whose sole responsibility is to ensure compliance with Contract Documents and manage the CONTRACTOR Quality Control Program, except that the Quality Control Manager may also serve as the site safety officer.

1.5 JOB CONDITIONS

A. Where Specifications require work to be field-tested or approved, it shall be tested in the presence of the AUTHORITY after timely notice of its readiness for inspection and testing, and the work after testing shall be concealed only upon approval of AUTHORITY.

B. The AUTHORITY shall have the right to witness all offsite tests. The CONTRACTOR shall notify the AUTHORITY at least seven (7) calendar days prior to testing.

C. The results of tests are for use by the AUTHORITY to evaluate the acceptability of materials with respect to specified testing requirements. Regardless of the test results, CONTRACTOR is solely responsible for quality of workmanship and materials and for compliance with requirements of Contract Documents.

D. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce work of specified quality. Verify applicability and follow all manufacturers' recommendations and instructions for assembly, installation and testing of materials and equipment. In any case where the CONTRACTOR believes that such recommendations or instructions are not applicable, the CONTRACTOR shall so notify the AUTHORITY and state the reasons for the CONTRACTOR's determination. The CONTRACTOR shall then follow the AUTHORITY's written direction on whether to follow manufacturer's recommendations and instructions.

E. Upon failure of materials and equipment, which have been tested or inspected, previous acceptance may be withdrawn and material may be subject to removal and replacement with material meeting Specification requirements, at no cost to the AUTHORITY.

1.6 MANUFACTURER'S FIELD SERVICES

A. Required when technical specifications require the manufacturer or supplier

to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, and to start, test, and adjust equipment as applicable.

B. Submit to the AUTHORITY the manufacturer representative's written reports containing observations and recommendations within five (5) calendar days of manufacturer's field services. Provide three (3) copies and a digital version.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

A. The CONTRACTOR shall provide full and complete documentation of Quality Control procedures and activities in a Quality Control Program and Plan.

3.2 QUALITY CONTROL

A. The CONTRACTOR shall establish a Quality Control Program (Program) which shall establish the methodology to perform the CONTRACTOR's inspection and tests of all items including that of its subcontractors. The Program shall ensure conformance to applicable technical specifications and drawings with respect to the materials, Codes, workmanship, storage, installation, construction, finishes, functional performance, and identification. The Program shall be established for all construction work performed under this Contract, including assigned subcontract work. The Program shall specifically include surveillance and tests required in the technical specifications.

B. The CONTRACTOR shall coordinate all work requiring Special Inspection to ensure full access by Special Inspectors and Quality Assurance testing personnel to work, work performance, and testing preparation, operations and results.

C. CONTRACTOR shall describe the Program in a detailed Quality Control Plan that must be approved by the AUTHORITY prior to the start of any construction or offsite fabrication.

D. The Program shall include, as a minimum, the following components for all definable features of work:

1. Preparatory Inspection Meeting: CONTRACTOR shall schedule and attend a preparatory meeting to review testing procedures a minimum of a week prior to beginning work on any element of Work which has been identified in the Contract Documents to require testing and

inspection by the CONTRACTOR and Code-required Special Inspection. Subsequent meetings shall be conducted as necessary to ensure continued accuracy of testing and inspection procedures.

2. Document Control: CONTRACTOR's Program to include procedure for ensuring that all Work is performed in accordance with the following:

   a. Conformed sets of Contract Drawings and Specifications.
   b. Contract Change Order documents.
   c. Approved Submittals.
   d. Applicable Requests for Information (RFI's).
   e. Manufacturer's Instruction.

3. In Progress Inspection: CONTRACTOR shall perform in-progress inspections as work progresses on the Work which shall include, but not be limited to:

   a. Examination of the quality of workmanship with respect to Contract Drawings, Technical Specifications and Approved Submittals.
   b. Review of control testing for compliance with Contract requirements.
   c. Inspection for use of defective or damaged materials, omissions and dimensional requirements.
   d. Review of timeliness and scheduling requirements for all tests, retests and eventual approvals.
   e. CONTRACTOR Deficiency Reports and punch lists as appropriate to the level of completion of the work.

4. Non-Conformance Procedure: CONTRACTOR's program shall include procedure for identifying, documenting, tracking, and resolving items in the Work which do not comply with Contract Documents, Specifications, Approved Submittals, or Manufacturer's Instructions. If a quality control test indicates that the tested material does not conform to the requirements of the Contract Documents, the CONTRACTOR shall take supplemental tests at the same location from which the non-conforming result was obtained, after correction of the work, to document conformance with the Contract Documents. Otherwise, the AUTHORITY reserves the right to reject materials for which final Quality Control tests indicate non- conformance with the Contract Documents.
5. Code Required Inspection: CONTRACTOR shall coordinate and make timely requests for inspections, tests and other activities required by Codes and Regulations as specified.

3.3 RECORD KEEPING

A. The CONTRACTOR shall maintain current Quality Control records, on forms acceptable to the AUTHORITY, of all inspections and tests performed. The records shall include factual evidence that the required inspections or tests have been performed, including, but not limited to, the following information for each such test and inspection: specification reference, date, type and number of inspections or test involved; results of the inspections, tests or retests; the nature of defect, causes for rejection, proposed remedial action, corrective action(s) taken, and similar information related to any reinspection.

B. The CONTRACTOR shall maintain and submit to the AUTHORITY the following Quality Control records and reports:

1. Daily Reports: The CONTRACTOR shall maintain a daily log of all inspections performed for both CONTRACTOR and subcontractor operations. The Daily Log shall include compliance with shop drawings submittals, identification by specification section and schedule activity of inspections, tests, and retests conducted, results of inspections and tests, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed. One copy of each Daily Reports shall be submitted to the AUTHORITY weekly.
2. Immediate Notification of Deficiencies: CONTRACTOR shall provide immediate notification to the AUTHORITY whenever a failed nonconforming test or inspection occurs. This immediate notification shall be followed up with the required written reports.
3. Nonconformance Report: CONTRACTOR shall submit three copies of a weekly Nonconformance Report to the AUTHORITY identifying all substandard inspections and tests taken during the week including identification by specification section and schedule activity of the inspection or test, location and nature of defects, causes for rejection and remedial actions taken or proposed. The Nonconformance Report shall also identify corrective actions taken or proposed for any open items on prior Nonconformance Reports including a scheduled date for resolution of each item. The Nonconformance Report shall be submitted and discussed in Progress Meetings.
4. Inspection Control Log: CONTRACTOR shall maintain an inspection control log chronologically recording each inspection and test performed by the CONTRACTOR, including the nature of the inspection, test or retest, the date performed, the results, causes for rejection, remedial action or corrective action taken and dates of subsequent inspections and retests, and final acceptance. The

CONTRACTOR shall submit three (3) copies of the updated Inspection Control Log weekly to the AUTHORITY; the Log will be discussed in Progress Meetings.

3.4 ORGANIZATION

A. The Program shall be implemented by the CONTRACTOR which shall as a minimum, consist of the following: Quality Control personnel shall be dedicated to Quality Control duties only, and independent of the production aspects of the CONTRACTOR's organization.

1. Quality Control Manager: The Quality Control Manager shall have the following qualifications: Minimum of 5 years' experience in a supervisory Quality Control position whose sole responsibility is to ensure compliance with the Contract Documents. This person shall be employed on this Project only, shall be physically on the Project site during performance of all Contract Work, and shall be in charge of the CONTRACTOR's Quality Control Organization. The Quality Control Manager shall report directly to the responsible corporate officer of the firm.
2. Quality Control Inspectors: The Quality Control Inspectors shall report directly to the Quality Control Manager. Quality Control Inspectors shall be provided as required to meet requirements of the Contract Documents for CONTRACTOR testing and inspection and as needed to verify that all aspects of the Work comply with the technical requirements of the Contract. Inspectors shall have minimum 5 years' experience inspecting the type of work being inspected. Submit qualifications as part of the Quality Control Plan.
3. Independent Testing and Inspection Laboratories: Provide and pay for an industry-recognized, independent laboratory or laboratories to perform all Quality Control tests and/or inspections as may be indicated by the nature of the construction or as specifically required under the terms of the Contract.
4. Pipe Weld Inspection: Contractor shall provide sufficient qualified inspection staff to adequately inspect 100% of the pipeline and piping joints visually in accordance with the Contract documents. Welding inspection shall be provided by an approved independent testing and inspection laboratory with at least five years of experience on similar projects.
5. Tank Welding Inspection: Same as above, except the type of the required inspections shall be in accordance with the technical specifications.
6. Coating Inspector: Contractor shall provide a NACE Certified Inspector

for all surface preparation and coating application covered by Section 09 97 13.23 – Exterior Steel Coatings. NACE Inspector shall be provided by an independent inspection company with five years of experience in Alaska on similar projects.

7. Welding Inspector(s): The Welding Inspector(s) shall have the responsibility of inspecting all welding operations associated with construction. He (they) shall be familiar with and have a working knowledge of AWS D1.1; ANSI/ASME 31.4, API 1104 and ASME BPVC Section IX. Duties include assuring compliance with Section 33 56
13.13 – Vertical Storage Tanks, Section 33 52 13.33 – Welded
Pressure Piping and include, but are not limited to the following:

   a. Ensure that the proper procedures are used during construction. Periodically record voltage, amperage, welding speed, and consumable types used in each welding procedure.
   b. Assist with the certification of each welder and welding operator in accordance with the Engineer's Specification. Prepare and maintain a list of qualified welders, and periodically confirm that only qualified welders are working on the construction project.
   c. Verify the operational condition of all welding equipment.
   d. Maintain records of weld rejections and repairs and, where appropriate, require requalification of welders or procedures with excessive rejections.
   e. Ensure that consumables are properly stored and issued to welders.
   f. Check fit-up of manual welds prior to production welding, and periodically inspect fit-up of automatic welds including inspection of joint edge penetration.
   g. Visually inspect fit-up and general pipe condition.
   h. Monitor preheat interpass temperatures; ensure that no welding is performed on a wet surface or under conditions of excessive wind velocity at the weld.
   i. Assure good workmanship, quality welds, and satisfactory weld repairs as per Engineer's Specifications.
   j. Check material to be welded and the type of weld to be made and document, with material certification, where applicable.
   k. Audit inspections and perform any inspections as required.
   l. Review electrode selection, storage, and maintenance.
   m. Audit field weld quality by interpreting radiographs.
   n. Troubleshoot inspection problems.
   o. Report unsafe work practices and areas.
   p. Assure that welders are not disposing of welding

consumable and/or any other refuse in the pipeline or piping.

8. NDE Inspector(s): The NDE Inspector(s) shall be familiar with and have a working knowledge of AWS D1.1, ANSI B31.4, API 1104 and all applicable drawings, inspection requirements, and referenced standards. Individual(s) shall be certified in accordance with the American Society for Nondestructive Testing, SNT-TC-1a. His duties shall include, but are not limited to the following:

   a. Inspection of qualification of each NDE Contractor or inspector based on personal observation of their work, certification documents, training, and experience. Maintain records of all qualified personnel.
   b. Verify that the Contractor's NDE procedures have been approved by Engineer.
   c. Establish an independent records system of the Contractor's work and compare results with the Contractor's system at least weekly, and advise the Chief Inspector as appropriate of any discrepancies.
   d. Study and understand the Specifications, Drawings, and all supporting documents with respect to inspection requirements.
   e. Approve calibration and operating condition of equipment.
   f. Schedule NDE for all work activities.
   g. Perform visual inspection of welding and any other work to be subject of NDE.
   h. Report unsafe work practices and areas.

B. Staffing Levels: Provide sufficient qualified personnel to monitor the work quality at all times. The scheduling and coordinating of all inspection and testing must match the type and pace of work activity.

1. In cases where multiple trades, disciplines or subcontractors are on site at the same time, each activity shall be inspected and tested by personnel skilled in that portion of the work.
2. In cases where multiple shifts are employed, the Quality Control staff shall be increased as required to monitor the work on each shift.

3.5 QUALITY CONTROL PLAN

A. Provide a Quality Control Plan to the AUTHORITY no later than 30 days after Notice to Proceed. Plan shall be updated as required by "Detailed Quality Control Procedures" below, and approved by the AUTHORITY prior to construction.

B. Quality Control Plan Contents: Include the personnel, procedures, instructions and documents to be used.

1. Organization: A description of the CONTRACTOR's Quality Control Organization, including:

   a. An organization chart showing lines of authority and relationship of the quality control personnel and the CONTRACTOR's management and project personnel.
   b. Names and resumes of work experience and qualifications of personnel in the quality control program.
   c. Area of responsibility and authority of each individual in the quality control organization.

2. Inspection:

   a. Methods of performing quality control inspections including those for each subcontractor's work.
   b. Detailed lists of inspection activities for each specification section. See "Detailed Quality Control Procedures" below.

3. Testing:

   a. Description of how testing will be performed including identification and qualifications of the industry recognized testing laboratory or laboratories proposed for the work.
   b. Identify the testing methods, frequency, and number to be taken of each type of material requiring Quality Control testing. To facilitate the development of a testing plan, the AUTHORITY will provide a tabular schedule of minimum testing requirements, to be derived from the requirements contained in the contract documents. The CONTRACTOR shall be responsible for taking the tests summarized in the schedule, in conjunction with any other tests that may be required in the contract documents.

4. Documentation: Method of documenting Quality Control operation, inspection and testing.
5. Administration: Methods of administering Quality Control operations document control, non-conformance procedure, inspection and testing.
6. Letter of Authority: A copy of a letter of direction to the

CONTRACTOR's Quality Control Manager responsible for quality control outlining that person's duties and responsibilities and signed by responsible corporate officer of the firm. This letter shall include the authority to halt construction and direct removal and replacement of work not in compliance with the Contract.

7. Forms: Sample copies of all forms and reports to be used, a flow chart describing their distribution, and identification of those documents to be retained by the CONTRACTOR.
8. Subcontractor's Quality Control: The CONTRACTOR shall include, as part of its Quality Control Plan, specific methods of performing quality control inspections of onsite and offsite subcontractors.
9. Detailed Quality Control Procedures: Detailed descriptions of quality control activities for work under each section of the specifications. Include list of all tests, inspection and frequencies, personnel, and instruction prior to starting such work. The procedures shall be updated each month incorporating any changes. Changes shall be submitted at least one month prior to the Work effected by the change.

C. Quality Control Plan Approval:

1. Before the CONTRACTOR's Quality Control Plan is officially submitted, the CONTRACTOR shall meet with the AUTHORITY and discuss the CONTRACTOR's Quality Control Plan. The CONTRACTOR and the AUTHORITY shall jointly develop a mutual understanding of the details of the plan, including the forms to be used for recording the quality control operations, inspections, administration of the plan for both onsite and offsite work, and the interrelationship of CONTRACTOR and AUTHORITY inspection. The CONTRACTOR shall prepare minutes of the meeting, which shall be incorporated in the CONTRACTOR's Quality Control Plan, which shall then be officially submitted for approval.
2. If the AUTHORITY determines that the Quality Control Plan, personnel, inspections, tests, or records are not adequate, corrective actions shall be taken as directed prior to payment of the next monthly CONTRACTOR's Progress Report.
3. Notify the AUTHORITY in writing of any proposed change to the CONTRACTOR's Quality Control Plan; no such change shall be implemented prior to approval in writing by the AUTHORITY.

D. Quality Control Plan Implementation: Implementation of the Quality Control Plan is the responsibility of the CONTRACTOR. This implementation will be monitored by the AUTHORITY and deficiencies therein will be corrected at the sole expense of the CONTRACTOR.

3.6 QUALITY SURVEILLANCE BY THE AUTHORITY

A. All items of materials and equipment shall be subject to surveillance testing and inspection by the AUTHORITY at the point of production, manufacture or shipment to determine if the producer, manufacturer or shipper maintains an adequate inspection system which insures conformance to the applicable specifications and drawings with respect to materials, workmanship, construction, finish, functional performance and identification. In addition, all items or materials, equipment and work in place shall be subject to surveillance testing and inspection by the AUTHORITY at the site for the same purposes. Surveillance by the AUTHORITY does not relieve the CONTRACTOR of performing Quality Control inspections and testing of either onsite or offsite CONTRACTOR's or subcontractor's workplace or manufacturing assembly plant.

END OF SECTION

SECTION 01 51 00

CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Requirements for furnishing and maintaining construction facilities during the project.

1.2 RELATED REQUIREMENTS

A. Section 01 11 13 – Summary of Work.

B. Section 01 29 76 – Application for Payment.

C. Section 01 73 00 – Execution Requirements.

1.3 TEMPORARY ELECTRICITY

A. Unless specified elsewhere, the CONTRACTOR shall make their own provisions for temporary electrical service.

B. Provide lighting for construction operations.

1.4 TEMPORARY HEAT

A. Provide and pay for heat devices, insulated enclosure, tenting, and heat as required to maintain specified conditions for construction operations, to protect materials and finishes from damage due to temperature or humidity.

1.5 TEMPORARY VENTILATION

A. Provide and pay for ventilation of enclosed areas to cure materials, to disperse humidity, to prevent accumulations of dust, fumes, vapors, or gases, and to maintain a safe work environment.

1.6 TEMPORARY WATER SERVICE

A. Unless specified elsewhere, the CONTRACTOR shall make its own provisions for temporary water service.

1.7 TEMPORARY SANITARY FACILITIES

A. Unless specified elsewhere, provide and maintain required facilities and enclosures. Use of existing toilet facilities by CONTRACTOR is prohibited.

1.8 TEMPORARY TELEPHONE SERVICE

A. Unless specified elsewhere, provide, maintain and pay for telephone service to the CONTRACTOR field offices.

1.9 BARRIERS

A. Provide as required to prevent entry to construction areas and to protect adjacent properties from damage from construction operations

B. Maintain lights of such size and location each night between the hours of sunset and sunrise upon all obstructions resulting from work which may endanger or obstruct vehicle traffic, and be responsible for all damages to persons and property resulting from failure to maintain lights. Designate personnel to replace or relight markers or barricades and provide the AUTHORITY with their names and telephone numbers for use in summoning them as necessary.

1.10 FREEZE PROTECTION

A. Provide freeze protection for the Power Plant Module during on site storage and construction, as per Section 01 11 13 – Summary of Work, 1.04, A.5.

B. Provide freeze protection for temporary water and sanitary service piping, valves, and other components.

1.11 CONSTRUCTION FENCES

A. Include all supplementary parts necessary or required for a complete and satisfactory installation of temporary fences. All runs of the fence shall present the same general appearance.

B. Material requirements, unless shown otherwise on the Drawings:

1. Fabric: No. 9 ASW gage zinc coated or approved equal.
2. Barbed Wire (Zinc-coated): 3-strand twisted No. 12 ½ ASW gage galvanized steel wire with 4-point barbs of No. 14 ASW gage galvanized steel wire, or approved equal. The barbs shall be spaced approximately 4 inches apart.
3. Wire ties and tension wire: No. 7 ASW gage marcelled steel wire with same coating as fabric and conforming to ASTM A824.
4. Plywood, if used shall be painted.

C. Other requirements:

1. Used materials may be installed provided the used materials are good, sound, and are suitable for the purpose intended.
2. Posts and braces shall be galvanized steel pipe conforming to the requirements of ASTM F1038 and sized in accordance with Tables 1 through VI of Federal Specifications RR-F-191/3. Posts shall be spaced more than 10 feet apart.
3. Galvanizing of steel items will be required.
4. Temporary fences that are damaged from any cause during the progress of the work shall be repaired or replaced by the CONTRACTOR at the CONTRACTOR's expense.
5. If no longer required for the Work as determined by the AUTHORITY, temporary fences shall be removed. Removed facilities shall become the property of the CONTRACTOR and shall be removed from the site of the work.
6. In secure areas away from traffic, fence shall be 8 feet high. Fence construction shall include top and bottom tension wires. All fabric tension wire and barbed wire shall be installed taught with no more than 2 inch open gaps between bottom of fence and underlying surface.
7. Not Used.

1.12 PROTECTION OF INSTALLED WORK

A. Protect installed Work and provide special protection where required and where Work is installed in unsecure areas.

B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.

1.13 SECURITY

A. Provide security and facilities to protect Work from unauthorized entry, vandalism, or theft.

1.14 REMOVAL OF UTILITIES AND FACILITIES

A. Remove CONSTRUCTION FACILITIES, Services, Utilities and other related materials, prior to Substantial Completion inspection.

B. Clean and repair damage caused by installation or use of temporary work.

C. Restore permanent facilities used during construction to a 'like new' condition if it was provided by Contract, or the condition the facility was found prior to construction of this project for existing facilities.

1.15 SHORING AND BRACING

A. The CONTRACTOR is responsible for providing shoring and bracing required to accomplish the work. This includes shoring of adjacent facilities, shoring for installed work, and shoring and bracing for installation of structural steel.

B. The CONTRACTOR's shoring and bracing shall be designed by an Alaska registered structural engineer.

C. Provide a sealed and signed copy of shoring and bracing calculations to the AUTHORITY for informational purposes only. The submission of calculations to the AUTHORITY shall not transfer responsibility for the design of shoring and bracing to the AUTHORITY. Rather, the AUTHORITY will receive the calculations to verify they have been done by a registered engineer.

1.16 COST RESPONSIBILITY

A. Except as otherwise noted, the cost of construction facilities and utilities shall be the responsibility of CONTRACTOR.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 60 00

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Requirements for transportation and handling, storage and protection, substitutions, and product options.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 – General Conditions.

B. Section 01 11 13 – Summary of Work.

C. Section 01 33 00 – Submittal Procedures.

D. Section 01 33 23 – Shop Drawings, Product Data, and Samples.

E. Section 01 42 19 – Reference Standards.

F. Section 01 45 00 – Quality Control.

G. Section 01 51 00 – Construction Facilities.

H. Section 01 60 00 – Material and Equipment.

I. Section 01 73 00 – Execution Requirements.

1.3 TRANSPORTATION AND HANDLING

A. Transport products by methods to avoid product damage; deliver in dry, undamaged condition, in manufacturer's unopened containers or packaging.

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.

1.4 STORAGE AND PROTECTION

A. Handle and store materials for construction, products of demolition, and other items to avoid damage to existing buildings, and infrastructure.

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. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

D. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter. Cover such material to prevent material from being blown or transported away from the stockpile.

E. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions.

1.5 SUBSTITUTIONS

A. Prior to the bid opening, the Bidder shall make his own determination in selecting which specified or substitute equipment to base his proposal upon. Substituted items shall be equal to or better than that specified or indicated in regards to quality, workmanship, finish, space requirements, electrical requirements, performance, and warranties.

B. After the bid opening, the CONTRACTOR shall submit sufficient data in accordance with this Section to establish equality. The AUTHORITY shall be the sole judge of equality and acceptability.

C. Acceptance of substitute materials will not relieve the CONTRACTOR of the responsibility for any changes in his own Work or in the Work of other crafts

caused by the substitution. Any additional costs resulting from substitutions are the responsibility of the CONTRACTOR.

D. Only one request for substitution will be considered for each product. When substitution is not accepted, provide specified product.

E. The AUTHORITY will consider requests for Substitutions only within 90 days after date established by the Notice to Proceed.

F. Substitutions may be considered when a Product becomes unavailable through no fault of the CONTRACTOR.

G. Document each request with complete data substantiating compatibility of proposed Substitution with Contract Documents.

H. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

1.6 SUBSTITUTION SUBMITTAL PROCEDURE:

A. Submit four copies of Request for Substitution for consideration on Substitution Request Form provided by the AUTHORITY (Section 01 60 00-A). Limit each request to one proposed Substitution.

B. Submit certification signed by the CONTRACTOR, that the CONTRACTOR:

1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product. List similar projects using proposed product, dates of installation and user telephone number.
2. Will provide an equivalent warranty for the Substitution as for the specified Product.
3. Will coordinate installation and make changes to other Work, which may be required for the Work to be complete with no additional cost to AUTHORITY.
4. Waives claims for additional costs or time extension, which may subsequently become apparent from indirect costs.
5. Will reimburse AUTHORITY for review or redesign services associated with re-approval by Authorities.

C. Submit shop drawings, manufacturers' product data, and certified test results attesting to the proposed Product equivalence and variations between substitute and specified product. The burden of proof is on proposer.

D. The AUTHORITY will notify the CONTRACTOR in writing of decision to accept or reject request.

PART 2 PRODUCTS

2.1 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.

2.2 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers followed by the term "No Substitutions": use only specified manufacturers, no substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not specifically named that meets the description specifications of the named manufacturers, equal in substance, function, dimension, appearance, and quality.

PART 3 EXECUTION (NOT USED)

END OF SECTION

ALASKA ENERGY AUTHORITY	SUBSTITUTION REQUEST FORM (AFTER AWARD)	

Project: Metarvik Phase I Power System: Power Plant Module, ITB #XXXX Project No.: TBD

Contractor: _____

Specified item for which substitution is requested: _____
(reference specification section and paragraph)

The following product is submitted for substitution: _____
(describe proposed substitution and differences from specified item; attach complete technical, performance, and test data; state whether substitution affects dimensions and functional clearances shown on drawings or affects other trades, and include complete information for changes to drawings and/or specifications which proposed substitution will require for its proper installation.)

I certify the following:

Yes	No	
❑	☐	The substitute will perform adequately and achieve the results called for by the general design.
❑	☐	The substitute is similar, of equal substance, suited to the same use, and will provide the same warranty as the product specified.
❑	☐	An equivalent source of replacement parts is available.
❑	☐	The evaluation and approval of the proposed substitute will not delay the Substantial or Final Completion of the project.
❑	☐	Any change in the design necessitated by the proposed substitution will not delay the Substantial or Final Completion of the project.
❑	☐	The cost of any change in the design necessitated by the proposed substitution, including engineering and detailing costs, and construction costs caused by the substitution will be paid by the contractor at no cost to the State.
❑	☐	The cost of any license fee or royalty necessitated by the proposed substitution will be paid by the contractor at no cost to the State.

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

Signed: _____ Date: _____
Authorized Contractor Signature

Architect/Engineer Recommendation:

❑ Accepted ☐ Accepted as Noted ☐ Not Accepted ☐ Received Too Late

Remarks:

Signed: _____ Date: _____
Architect/Engineer

Recommend Acceptance / Rejection (circle one) _____ Date: _____
Resident Engineer

❑ Accepted
❑ Rejected _____ Date: _____
Project Manager

SECTION 01 73 00 EXECUTION REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Requirements for addressing defects, cleaning, operating and maintenance manuals, spare parts, training, warranties and bonds, and maintenance service.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 – General Conditions: Fiscal provisions, legal submittals, and other administrative requirements.

B. Section 01 26 63 – Change Procedures.

C. Section 01 31 19 – Project Meetings.

D. Section 01 33 00 –Submittal Procedures.

E. Section 01 33 23 – Shop Drawings, Product Data, and Samples.

F. Section 01 60 00 – Material and Equipment.

1.3 CLOSEOUT PROCEDURES

A. Comply with Section 01 77 00 - Contract Closeout Procedures.

1.4 DEFECTS

A. Product defects shall be all items that affect the visual appearance or function of the Products. Defects shall be as identified below unless more stringent requirements are specified within specific sections.

B. Products shall typically be viewed from a distance of 30.0 inches (760 mm).

C. Defects shall be solely determined by the Project Manager.

D. Defects, Product:

1. Cuts, Scrapes, Gouges Abrasions 0.250 inch (6 mm) long or longer, and 0.03125 inches (0.79375 mm) wide or wider that are visible at a distance of 30.0 inches (762 mm) shall be considered defects.
2. Abrasions less than the above shall be accepted.
3. Burns of any size that permanently discolor the surface material shall be considered defects.
4. Product color variation.

E. Defects, Joint:

1. Non-alignment of Products. Visual defects and non-alignment of joints shall be considered defective.

F. Defects, Structural:

1. Bent members or other structural damage shall be considered defective.
2. Incorrectly manufactured members shall be considered defective.

G. Defects, Corrosion:

1. Surface corrosion not exceeding one percent (1%) of the surface area shall be considered a visual defect.
2. Surface corrosion exceeding one percent (1%) and not exceeding five percent (5%) of the surface area shall be evaluated by the Project Manager.
3. Surface corrosion exceeding five percent (5%) of the surface area shall be shall be considered a defect.

H. Defects shall be repaired or replaced as solely determined by the Project Manager at no additional cost to the AUTHORITY.

1. Structural defects shall be replaced, no exceptions.
2. Visual defects shall be repaired or replaced as solely determined by the Project Manager.

1.5 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain work and storage areas free of waste materials, debris, and rubbish. Maintain site in a neat and orderly condition to maintain safe passage and exits and to avoid fire hazard. Provide covered containers for deposit of waste materials.

B. Collect and remove waste materials, debris, and rubbish from site periodically and at least weekly, and dispose off-site. Have equipment and personnel available on- site daily to sweep and clean work sites and interior work areas.

C. Comply with Section 01 74 00 – Cleaning and Waste Management.

1.6 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.

C. Use materials which will not create hazards to health or property, and which will not damage surfaces. Follow manufacturer's recommendations.

D. Maintain cleaning until AUTHORITY issues certificate of Substantial Completion.

E. Remove waste, debris and surplus materials from site. Clean work site and interior work areas; remove stains, spills, and foreign substances from all areas and sweep clean. Rake clean work site. Comply with Section 01 74 00 – Cleaning and Waste Management.

1.7 ADJUSTING

A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.8 OPERATION AND MAINTENANCE (O&M) DATA

A. Submit data bound in 3-ring slant “D” presentation ring binders, maximum 11-5/8” high and 11-1/4” deep. Spine, front, and back shall be heavy virgin vinyl sealed over heavy board. Binders shall have clear, full size pockets on spine and front cover. Thickness of content shall not exceed 75% of binder manufacturer’s stated capacity. All pages shall be 8 ½” x 11”, or 11” x 17” folded to 8 ½” x 11” in a manner to permit unfolding without removal from binder.

B. O&M Manual binders shall be black, clearly and permanently labeled as follows:

1. Spine

   Project Name

   Project Number

   Operations & Maintenance Manual, Volume_____of ____

   Facility Name:

2. Front Cover: Project

   Name: Project No.:

   Facility Name:

   CONTRACTOR:

   Address

   City, State, ZIP

   Phone: Fax:

   E-mail Address: Major

   Sub-Contractors:

   Address

   City, State, ZIP

   Phone: Fax:

   E-mail Address:

   Operations & Maintenance Manual, Volume_____of____

   Discipline:

   Date:

C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with 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. Include the complete Table of Contents in each volume, typed on 24 pound white paper, in three parts as follows:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, CONTRACTOR, Subcontractors, and major equipment suppliers.
2. Part 2: Operation and maintenance instructions, arranged by system process flow and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:

    a. List of equipment.
    b. Parts list for each component.
    c. Operating instructions.
    d. Maintenance instructions for equipment and systems.
    e. Maintenance instructions for finishes, including recommended cleaning methods and materials, special precautions identifying detrimental agents, and touchup procedures/materials.

3. Part 3: Project documents and certificates, including the following:

    a. Shop drawings and product data.
    b. Start-up and Commissioning reports.
    c. Certificates.
    d. Originals of warranties and bonds.

E. Submit one (1) draft copy of completed volumes 30 calendar days prior to Training or Substantial Completion inspection, whichever is earliest. This copy will be reviewed and returned, with AUTHORITY comments. Revise content of all document sets as required prior to final submission.

F. Submit four (4) sets of revised final volumes 7 days prior to Training or Substantial Completion inspection, whichever is earliest.

G. In addition to required hard copies, provide electronic copy on *.PDF format with Table of Contents hyperlinked to all referenced sections.

1.9 TRAINING

A. Before Substantial Completion, instruct AUTHORITY designated personnel

in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times. For equipment requiring seasonal operation, or placed into operation subsequent to Final Completion, perform instructions within six (6) months.

B. Use operation and maintenance manuals as basis of instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

C. Unless specified elsewhere, the duration of on-site instruction shall be eight (8) hours, minimum.

D. Provide digital video recordings of all provided instruction in format approved by AUTHORITY. Training videos shall be submitted prior to Final Completion.

E. Prepare and insert additional data in Operation and Maintenance Manual when need for such data that its need becomes apparent during instruction.

1.10 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Not Used.

1.11 WARRANTIES AND BONDS

A. Provide duplicate notarized copies.

B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.

C. Provide Table of Contents and assemble in three D side ring binder with durable plastic cover, similar to O&M Manual.

D. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

1.12 MAINTENANCE SERVICE

A. Not Used

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 77 00

CONTRACT CLOSEOUT

PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Requirements for Substantial Completion.

B. Requirements for Final Completion.

C. Requirements for Final Acceptance and Payment.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 – General Conditions: Substantial Completion, Final Completion, Final Payment, and Final Acceptance.

B. Section 01 11 13 – Summary of Work.

C. Section 01 29 73 – Schedule of Values.

D. Section 01 29 76 – Application for Payment.

E. Section 01 33 00 – Submittal Procedures.

F. Section 01 73 00 – Execution Requirements.

G. Section 01 78 39 – Project Record Documents.

1.3 SUBSTANTIAL COMPLETION SUBMITTALS

Submit the following prior to requesting the Substantial Completion Inspection:

A. Evidence of Compliance with Requirements of Authority Having Jurisdiction:

1. Certificate of Occupancy.
2. Required Certificates of Inspection.
3. Other approvals as may be required.

B. Project Record Documents

C. Operation and Maintenance Data.

D. Spare Parts and Maintenance Materials.

E. Warranties and Bonds.

F. Keys and Keying Schedule.

G. No progress payments will be made for Substantial Completion until all required submittals have been submitted and accepted by the AUTHORITY.

1.4 SUBSTANTIAL COMPLETION

A. In accordance with Section 00 70 00 – General Conditions, Article 13.10 Substantial Completion, the CONTRACTOR shall notify the AUTHORITY in writing that the Work or a portion of the Work which has been specifically identified in the Contract Documents (except for items specifically listed by the CONTRACTOR as incomplete) is substantially complete and request that the AUTHORITY issue a Certificate of Substantial Completion. The AUTHORITY will consider the CONTRACTOR's request for Substantial Completion only when:

1. Written request for Substantial Completion is provided at least fourteen (14) calendar days in advance of the AUTHORITY's scheduled Substantial Completion inspection date.
2. List of items to be completed or corrected is submitted.
3. All Operation and Maintenance Manuals are submitted and approved by the AUTHORITY.
4. All commissioning requirements have been met.
5. All equipment and systems have been tested, adjusted, are properly operating and fully operational.
6. All demonstration and training requirements have been completed, or the date(s) for required demonstration and training have been scheduled with the AUTHORITY.
7. All automated and manual controls are fully operational.
8. Operation of all equipment and systems has been demonstrated to the AUTHORITY or their designated representative.
9. Certificate of Occupancy is submitted.
10. Certificates of Inspection for required inspections have been submitted for all required inspections.
11. Project Record Documents for the Work or the portion of the Work being accepted are submitted and approved.
12. Spare parts and maintenance materials are turned over to AUTHORITY.

13. All keys are turned over to the AUTHORITY.
14. All warranties and bonds are submitted and approved.
15. Final cleaning has been completed to the satisfaction of the AUTHORITY.

B. When all of the preceding requirements for the consideration of Substantial Completion have been met, the AUTHORITY will conduct a scheduled Substantial Completion inspection with its Architect/Engineers and other required representatives. If upon the completion of the inspection, the AUTHORITY should find that the Work is not substantially complete, AUTHORITY will promptly notify CONTRACTOR in writing, listing observed deficiencies.

C. The CONTRACTOR shall remedy deficiencies and send a second written notice of Substantial Completion.

D. When the AUTHORITY finds the Work is substantially complete, it will have fourteen (14) days to issue a certificate of Substantial Completion with an attached punch list of deficiencies, all in accordance with the provisions of the General Conditions.

E. The CONTRACTOR shall be responsible for scheduling the activities required for Substantial Completion to enable completion within the Contract Time.

1.5 FINAL COMPLETION

A. In accordance with Section 00 70 00 – General Conditions, Article 13.13 Final Completion, when the CONTRACTOR considers that it has completed all the deficiencies listed on the Substantial Completion punch list, and that the Work is otherwise complete, it shall submit written certification that:

1. Contract Documents have been reviewed.
2. Work has been completed in accordance with Contract Documents, and deficiencies listed with certificate of Substantial Completion have been corrected.
3. Work is complete and ready for final inspection.

B. Upon the receipt of the preceding written notice, the AUTHORITY will conduct a Final Completion inspection. If the AUTHORITY should then find the Work to be incomplete, it will promptly notify the CONTRACTOR in writing with a list of observed deficiencies.

C. The CONTRACTOR shall remedy deficiencies and transmit to the

AUTHORITY a second certification of Final Completion.

D. When the AUTHORITY determines the Work is complete, all in accordance with the General Conditions article, "Final Completion and Application for Payment", the CONTRACTOR may make application for Final Payment.

1.6 REINSPECTION FEES

A. In accordance with Section 00 70 00 – General Conditions, Articles 13.10 Substantial Completion and 13.12 Final Inspection, the CONTRACTOR shall pay for all costs incurred by the AUTHORITY for re-inspection.

B. The AUTHORITY may deduct the re-inspection costs from the application for final payment.

1.7 FINAL ACCEPTANCE

A. Following the issuance of Final Completion, and subject to the completion of requirements specified in Section 00 70 00 – General Conditions, Articles 13.14 Final Payment and 13.15 Final Acceptance, the AUTHORITY will review the project files for completeness. The AUTHORITY may require the CONTRACTOR to submit or re-submit any of the following documents, upon request:

1. Contractor's transmittal letter: O&M Manuals.
2. Contractor's transmittal letter: Warranty/Bonds.
3. Contractor's transmittal letter: Record Documents.
4. Spare parts, maintenance materials receipts.
5. Contractor's transmittal letter: Keys & keying schedule.
6. Contractor's certification of insurance.
7. EEO compliance certification (Federally funded projects only).
8. Submittals and miscellaneous registers.
9. Original final pay estimate.
10. Contractor's release.
11. AUTHORITY of Labor Notice of Completion (NOC).
12. Other documentation as required by the AUTHORITY.

B. Statement of Adjustment of Accounts – The AUTHORITY may require the CONTRACTOR to submit a final statement reflecting adjustments to the Contract Price showing:

1. Original Contract Price.
2. Previous Change Orders.

3. Changes under Allowances.
4. Changes under Unit Prices.
5. Deductions for uncorrected Work.
6. Penalties and Bonuses.
7. Deductions for Liquidated Damages.
8. Deductions for Re-inspection Fees
9. Other adjustments to Contract Price.
10. Total Contract Price as adjusted.
11. Previous payments.
12. Sum remaining due.

C. AUTHORITY will issue a final Change Order reflecting all remaining adjustments to Contract Price not previously made by Change Orders.

D. See Section 01 29 73 - Schedule of Values for minimum value that shall be assigned for Final Acceptance.

E. The CONTRACTOR shall cooperate with the AUTHORITY and shall provide the requested documentation.

F. When the AUTHORITY determines its files are complete, it may make final payment and issue a letter of Final Acceptance.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 78 39 PROJECT

RECORD DOCUMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Maintenance of Record Documents and Samples.

B. Submittal of Record Documents and Samples.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 - General Conditions: Record Documents.

B. Section 01 11 13 – Summary of Work.

C. Section 01 29 76 – Application for Payment.

D. Section 01 33 23 – Shop Drawings, Product Data, and Samples.

E. Section 01 77 00 – Contract Closeout Procedures.

F. Individual Specifications Sections: Manufacturer's certificates and certificates of inspection.

1.3 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. In addition to requirements in General Conditions, maintain at the site for the AUTHORITY one accurate and up to date record copy of:

1. Contract Drawings
2. Specifications
3. Addenda
4. Change Orders and other modifications to the Contract
5. Reviewed Shop Drawings, product data, and samples
6. Survey and field records
7. Field test records
8. Inspection certificates
9. Manufacturer's certificates

B. Prior to Substantial Completion, provide original or legible copies of each item maintained by CONTRACTOR in other Sections, as listed by spec section in Paragraph 1.02.B, C, and D above.

C. Delegate responsibility for management of maintenance of Record Documents to one person on CONTRACTOR's staff as approved in advance by Project Manager.

D. Promptly following award of Contract, secure from AUTHORITY, at no cost to the CONTRACTOR, one complete set of all Documents comprising the Contract.

E. Immediately upon receipt of job set described above, identify each Document with title "RECORD DOCUMENTS – JOB SET".

F. Store record documents and samples in field office apart from documents used for Construction. Provide files, racks, and secure storage for Record Documents and samples.

G. Label and file Record Documents and samples in accordance with Section number listings in table of contents of this Project manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

H. Maintain Record Documents in a clean, dry and legible condition. Do not use record documents for construction purposes.

I. Use all means necessary to maintain job set of Record Documents completely protected from deterioration and from loss and damage until completion of Work and transfer of recorded data to AUTHORITY.

J. Keep record documents and samples available for inspection by AUTHORITY.

K. Upon request by the AUTHORITY, and at time of each Application for Payment, enable inspection of Record Documents by the AUTHORITY for review as to completeness.

L. AUTHORITY approval of current status of Record Documents will be prerequisite to AUTHORITY's approval of requests for progress payments and request for final payment.

1. Prior to submitting each request for progress payment, secure AUTHORITY's approval of Record Documents as currently maintained.

2. Prior to submitting request for Final Payment, obtain AUTHORITY's approval of final Record Documents.

M. Do not use job set for any purpose except entry of new data and for review and copying by AUTHORITY.

1.4 RECORDING

A. Record information on a set of 'black-line' opaque Drawings, and in a copy of a Project manual, provided by AUTHORITY.

B. Using felt tip marking pens or colored pencil, maintaining separate colors for each major system, clearly describe changes by note and by graphic line, as required. Date all entries. Call attention to entry by a "cloud" around area or areas affected.

C. Thoroughly coordinate all changes within Record Documents, making adequate and proper entries on each Specification Section and each sheet of Drawings and other Documents where such entry is required to properly show change or selection.

D. When a change within Record Documents is referenced to another document, such as a RFI's, Shop Drawing or Change Order, attach a copy of the referenced document to the respective Record Drawing or Record Specification where the entry is made.

E. Contract Drawings and Shop Drawings: Legibly mark each item to record actual construction, including:

1. Measured depths of elements of foundation in relation to finish first floor datum. Accurate to the nearest inch.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Accurate to the nearest inch.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
4. Field changes of dimension and detail.
5. Changes made by modifications.
6. Details not on original Contract Drawings.
7. References to related Shop Drawings and modifications.
8. Clearly label all changes and show dimensions to establish size and location. All identifications shall be sufficiently descriptive to relate

reliably to Specifications.

F. Other Documents: Maintain manufacturer's certifications, inspection certifications, and field test records required by individual Specifications sections.

1.5 SUBMITTALS

A. Upon submittal of the completed Record Documents, make changes in Record Documents as required by the AUTHORITY.

B. Transmit with cover letter in duplicate, listing:

1. Date
2. AUTHORITY's Project title and number
3. CONTRACTOR's name, address, and telephone number
4. Number and title of each record document
5. Signature of CONTRACTOR or authorized representative.

C. Final Record Documents shall include both hard copies and digitally scanned copies in *.PDF format (high quality grayscale scans, minimum 200 pixels/inch). Scans shall include front and back of drawings/documents where information occurs on both sides.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 05 12 00

STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Structural steel framing members and support members.

B. Plates and fabricated connections.

1.2 WORK INCLUDED

A. This section covers the work necessary to fabricate and install the generator connex steel containment floor, doorframe, mechanical wall penetrations, miscellaneous connex structural steel improvements, other steel fabrication, and connex foundation W-Beams as shown on the drawings.

1.3 RELATED REQUIREMENTS

A. Section 01 33 00 – Submittal Procedures.

B. Section 05 50 00 – Metal Fabrications.

C. Section 09 96 00 – High Performance Coatings.

D. Section 09 98 00- Hot Dip Galvanized Coating.

1.4 REFERENCE STANDARDS

A. AISC (MAN) - Steel Construction Manual; American Institute of Steel Construction, Inc.

B. AISC S303 - Code of Standard Practice for Steel Buildings and Bridges; American Institute of Steel Construction, Inc.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.

D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

E. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished.

F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

G. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

H. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric).

I. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.

J. ASTM A563M - Standard Specification for Carbon and Alloy Steel Nuts [Metric].

K. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.

L. ASTM A992/A992M - Standard Specification for Structural Steel Shapes.

M. ASTM F436 - Standard Specification for Hardened Steel Washers.

N. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105 ksi Yield Strength.

O. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society.

P. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society.

1.5 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures.

B. Shop Drawings:

1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
2. Connections.
3. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.

C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.

D. Mill Test Reports: Indicate structural strength, destructive test analysis and non-

destructive test analysis.

E. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

F. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.6 QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with AISC "Steel Construction Manual."

B. Fabricator: Company specializing in performing the work of this section with minimum 5 years of experience.

C. Qualifications for Welding Work: Qualify welding procedures and welding operators in accordance with AWS "Qualification" requirements.

1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.

2. If recertification of welders is required, retesting will be Contractor's responsibility.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Fabricate or deliver materials to site at such intervals to ensure uninterrupted progress of work.

B. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration. If bolts and nuts become dry or rusty, clean and re-lubricate before use.

1. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. At Contractor’s expense, repair or replace damaged materials or structures as directed.

PART 2 PRODUCTS

2.1 MATERIALS

A. Metal Surfaces, General: For fabrication of work that will be exposed to view, use only materials that are smooth and free of surface blemishes including pitting, rust

and scale seam marks, roller marks, rolled trade names, and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating, and applying surface finishes.

C. Steel Shapes, Plates, and Bars: ASTM A36, 50 ksi material is acceptable for structural shapes, if more readily available.

B. Cold-Formed Structural Tubing: ASTM A500.

C. Pipe: ASTM A53/A53M, Grade B, Finish black.

D. Electrodes for Welding: Comply with AWS Code.

E. High-Strength Structural Bolts, Nuts, and Washers: ASTM A325 or A325M, Type 1, medium carbon, galvanized, with matching compatible ASTM A563 or A563M nuts and ASTM F436 washers.

2.2 FABRICATION

A. Shop fabricate to greatest extent possible.

B. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings.

1. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.
2. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

C. Continuously seal joined members by continuous welds. Grind exposed welds smooth.

D. Fabricate connections for bolt, nut, and washer connectors.

E. Bolt field connections, except where welded connections or other connections are indicated. Use Hot-Dipped Galvanized or 316 Stainless Steel bolts.

F. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work.

G. Assemble and weld built up sections by methods that will produce true alignment of axes without warp.

H. Holes for Other Work: Provide holes required for securing other work to structural

steel framing and for passage of other work through steel framing members, as shown on final shop drawings.

I. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

2.3 FINISH

A. Shop coat structural steel members, connex exterior vertical services uncovered by meatal siding, connex exterior wall penetrations and all connex interior surfaces in accordance with Section 09 96 00 High Performance Coatings, and the Plans.

B. Hot Dip Galvanizing: Galvanize all structural steel shapes, plates, bolts and hardware as noted in the plans in accordance with Section 09 98 00, ASTM A 123, and ASTM A 153,

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

B. Materials and fabrication procedures are subject to inspection and tests in mill, shop, and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve CONTRACTOR of responsibility for providing materials and fabrication procedures in compliance with specified requirements.

1. At CONTRACTOR'S expense, promptly remove and replace materials or fabricated components that do not comply.

C. Design of Members and Connections: Details shown are typical; similar details apply to similar conditions, unless otherwise indicated. Verify dimensions at site whenever possible without causing delay in the work.

1. Promptly notify Project Manager whenever design of members and connections for any portion of structure are not clearly indicated.

3.2 ERECTION

A. Erect structural steel in compliance with AISC "Code of Standard Practice for Steel Buildings and Bridges."

B. Temporary Shoring and Bracing: Allow for erection loads, and provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines

to achieve proper alignment of structures as erection proceeds.

C. Shop Welding: Contractor shall inspect and test during fabrication of structural steel assemblies, as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.

2. Perform visual inspection of all welds.

D. Field Assembly: Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces that will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

E. Level and plumb individual members of structure within specified AISC tolerances.

F. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members that are not under stress, as acceptable to Project Manager. Finish gas-cut sections equal to a sheared appearance when permitted.

G. Touch-Up Repairs: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint or galvanizing.

H. Galvanizing Repair: Galvanized coating at damaged areas shall be repaired according to ASTM A 780 (Annex A1) using zinc-based alloy repair sticks commonly known as “hot sticks”.

I. Coating Repair: If underlying metal surface is exposed, wheel abrade or sandblast to clean metal and re-coat same as tanks. If damage does not fully penetrate coating then reapply top coat only to minimum DFT.

J. Field weld components indicated on shop drawings.

K. Do not field cut or alter structural members without approval of Engineer.

3.3 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

3.4 FIELD QUALITY CONTROL

A. The AUTHORITY, or AUTHORITY'S representatives, will visually inspect welded connections.

B. The AUTHORITY reserves the right to contract an independent testing firm to test welded connections.

C. Provide access for the AUTHORITY'S inspectors or testing agency representatives to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.

D. The AUTHORITY may inspect structural steel at plant before shipment.

E. Correct deficiencies in structural steel work that inspection and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at CONTRACTOR'S expense, as necessary to reconfirm any noncompliance of original work and to show compliance of corrected work.

F. Shop Welding: CONTRACTOR shall inspect and test during fabrication of structural steel assemblies, as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
2. Perform visual inspection of all welds.

G. Field Welding: CONTRACTOR shall inspect and test during erection of structural steel as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
2. Perform visual inspection of all welds.

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Preservative treated wood materials.

B. Framing with dimension lumber.

C. Wood blocking and nailers.

D. Wood furring.

E. Wood sleepers.

1.2 WORK INCLUDED

A. This section covers the work necessary to install the generator connex interior control room wood floor and partition wall, exterior wall and roof support framing, and foundation timbers as shown on the drawings, including but not limited to framing with dimensional lumber, wood furring, grounds, nailers, and blocking, fasteners, and metal framing anchors.

1.3 RELATED REQUIREMENTS

A. Section 01 33 00 – Submittal Procedures.

B. Section 01 60 00 – Material and Equipment.

C. Section 01 74 00 – Cleaning and Waste Management.

D. Section 06 05 00 – Fasteners and Supports.

E. Section 06 16 00 – Sheathing.

1.4 REFERENCE STANDARDS

A. AWPA U1 – Use Category System: User Specification for Treated Wood; American Wood Protection Association; 2010.

B. PS 20 – American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2005.

C. WWPA G-5 – Western Lumber Grading Rules; Western Wood Products Association; 2011.

1.5 SUBMITTALS

A. See Section 01 33 00 – Submittal Procedures.

B. Product Data: For each type of process and factory-fabricated product.

1. Provide technical data on wood preservative materials and application instructions.

C. Manufacturer's Certificate: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee Board of Review.

D. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:

1. Wood-preservative-treated wood.
2. Power-driven fasteners.

1.6 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Dimension Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Provide dressed lumber, S4S, unless otherwise indicated.
3. Species:
   - Rafters and headers - Douglas Fir
   - Partitions, Furring, and other framing - Douglas Fir or Hem Fir.
4. Grade: No. 2 or better.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. All dimensional lumber and roof plywood shall be wood – preservative treated lumber.

B. Treated Lumber and Plywood: Comply with requirements of AWPA U1 – Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.

D. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

E. Application: Treat all rough carpentry, unless otherwise indicated.

F. Preservative Treatment:

1. Manufacturers:

a. Arch Wood Protection, Inc.: www.wolmanizedwood.com.
b. Chemical Specialties, Inc.: www.treatedwood.com.
c. Osmose, Inc.: www.osmose.com.
d. Substitutions: See Section 01 60 00 – Material and Equipment.

2. Preservative Pressure Treatment of Lumber in Contact with Soil: AWPA U1, Use Category UC4B, Commodity Specification A using waterborne preservative to 0.4 lb. /cu ft. retention.

a. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.

2.3 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified.

1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Power-Driven Fasteners: NES NER-272.

C. Wood screws: ASME B18.6.1.

D. Bolts, Lags, screws and other and other fasteners for use in treated wood shall be hot dipped galvanized in accordance with ASTM A123.

1. Z-Max or hot dipped galvanized connectors: Provide hot dipped galvanized fasteners.

E. Lag Screws: Provide as indicated on drawings, ANSI/ASME Standard B18.2.1., Fyb = 45,000 psi.

1. Verify member alignment prior to lag bolt installation.
2. Install lag bolts in pre-drilled lead holes as follows:

a) The lead hole for the shank shall have the same diameter as the shank, and the same depth as the length of the unthreaded shank.
b) The lead hole for the threaded portion of the lag bolts shall have a diameter equal to 60% to 70% of the shank diameter and a length equal to the length of the threaded portion of the lag screw.

3. Use of soap or approve lubricant is permitted.
4. Tighten lag bolt using a wrench. Driving by hammer is not permitted.
5. Provide 2-inch minimum diameter washers at lag bolt heads in direct contact with wood members.

F. Bolts: Wood to steel or wood to wood, Structural Bolts, Nuts, and Washers: ASTM A307, medium carbon, galvanized, with matching compatible nuts and washers.

2.4 METAL FRAMING ANCHORS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. List of manufacturers.

B. Basis-of-Design Products: Subject to compliance with requirements, provide products indicated on Drawings or comparable products by one of the following:

1. Alpine Engineered Products, Inc.
2. Cleveland Steel Specialty Co.
3. Harlen Metal Products, Inc.
4. KC Metals Products, Inc.
5. Simpson Strong-Tie Co., Inc.

6. Southeastern Metals Manufacturing Co., Inc.
7. USP Structural Connectors.

C. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, which meet or exceed those of basis-of-design products. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

D. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

PART 3 EXECUTION

3.1 INSTALLATION

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

D. Metal Framing Anchors: Install metal framing to comply with manufacturer's written instructions.

E. Do not splice structural members between supports, unless otherwise indicated.

F. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

G. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
3. Table 23-II-B-1, "Nailing Schedule," and Table 23-II-B-2, "Wood Structural Panel Roof Sheathing Nailing Schedule," in ICBO's Uniform Building Code.
4. Table 2305.2, "Fastening Schedule," in BOCA's National Building Code.
5. Table 2306.1, "Fastening Schedule," in SBCCI's Standard Building Code.
6. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.

7. Table 602.3(1), "Fastener Schedule for Structural Members," and Table 602.3(2), "Alternate Attachments," in ICC's International One- and Two-Family Dwelling Code.

3.2 PROTECTION

A. Do not burn scrap on project site.

B. Do not burn scraps that have been pressure treated.

C. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

END OF SECTION

SECTION 06 16 00

SHEATHING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wall Sheathing.

B. Roof Sheathing.

C. Subflooring.

D. Sheathing Joint and Penetration Treatment.

1.2 WORK INCLUDED

A. This section covers the work necessary to install the generator conex interior control room wood flooring and partition wall sheathing, and roof sheathing as shown on the drawings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

1.4 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated plywood.

PART 2 PRODUCTS

2.1 WOOD PANEL PRODUCTS, GENERAL

A. Plywood: DOC PS 1 unless otherwise indicated.

2.2 PRESERVATIVE-TREATED PLYWOOD

A. Preservative Treatment by Pressure Process: AWPA C9.

B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

C. Application: Treat items indicated on Drawings.

D. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC4ab for exterior construction in contact with ground.

2.3 WALL SHEATHING

A. Plywood Sheathing: Exterior sheathing.

2.4 ROOF SHEATHING

A. Plywood Roof Sheathing: Exterior sheathing.

2.5 SUBFLOORING AND UNDERLAYMENT

A. Plywood Combination Subflooring-Underlayment: Exterior, C-C Plugged, Underlayment T&G single-floor panels.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

2.7 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in the ICC's International Residential Code for One- and Two-Family Dwellings.
3. ICC-ES evaluation report for fastener.

D. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

F. Block all diaphragm roof panel edges with 2 x 4 flat blocking.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Subflooring:

   a. Glue and nail to wood framing.
   b. Space panels 1/8 inch apart at edges and ends.

2. Wall and Roof Sheathing:

   a. Nail to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.
   b. Space panels 1/8 inch apart at edges and ends.

END OF SECTION

SECTION 07 21 00

THERMAL INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Extruded polystyrene foam-plastic board.

B. Expanded polystyrene foam-plastic board.

C. Glass-fiber blanket.

D. Mineral-wool blanket.

1.2 RELATED REQUIREMENTS

A. Section 06 16 00 – Sheathing, for foam-plastic board sheathing installed directly under metal siding.

1.3 SUBMITTALS

A. Product Data: For each type of product.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation and concealment.

PART 2 PRODUCTS

2.1 POLYSTYRENE FOAM-PLASTIC BOARD

A. Extruded Polystyrene Board, ASTM C 578, Type VI, 40-psi minimum compressive strength; maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.

1. Fire propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

B. Expanded Polystyrene Board Insulation: ASTM C578, Type XIV, 40 psi minimum compressive strength.

1. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.2 GLASS-FIBER BLANKET

A. Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

2.3 MINERAL-WOOL BLANKETS

A. Mineral-Wool Blanket, Unfaced: ASTM C 553 Type VII (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

PART 3 EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF CAVITY-WALL INSULATION

A. Foam-Plastic Board Insulation: Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.

3.4 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.

B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.
2. Spray Polyurethane Insulation: ASTM C 1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84. Apply according to manufacturer's written instructions.

END OF SECTION

SECTION 07

92 00 JOINT

SEALANT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Furnishing and installing all sealant where indicated on the Drawing.

1.2 RELATED REQUIREMENTS

A. Section 01 33 00 – Submittal Procedures.

B. Section 01 45 00 – Quality Control.

C. Section 05 50 00 – Metal Fabrications.

D. Section 09 97 13.23 – Exterior Steel Coatings.

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00.

1. Product Literature for each material used.
2. Manufacturer's surface preparation and installation instructions.

B. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacture and product name.
3. Joint-sealant color.

1.4 QUALITY ASSURANCE

A. Installers: Use only skilled workmen specially trained in the techniques of sealing and familiar with the published recommendations of the manufacturers of the sealants being used.

B. Verify that sealants are compatible with the substrates and accessory materials provided under other Sections. Notify Engineer of evidence of incompatibility.

1.5 ENVIRONMENTAL CONDITIONS

A. Install and protect sealants under conditions recommended by the

manufacturer and as follows:

1. Do not apply sealant when ambient temperatures are below 40 degrees F, or expected to fall below 40 degrees F before sealant cure is complete.
2. Do not apply sealant to substrates or accessories that are moist.

PART 2 PRODUCTS

2.1 MATERIALS. GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Joint Sealants:

1. Products: Subject to compliance with requirements, provide one of the products listed.
2. Manufacturers: Where no product is listed, subject to compliance with requirements, provide products from one of the following manufacturers:

a. BSAF.
b. Dow.
c. Pecora Corporation.
d. Sika Corporation, Construction Products Division.
e. Tremco Incorporated.

C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.1 SILICONE JOINT SEALANTS

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.

B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

C. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 35, for Use NT.

2.2 URETHANE JOINT SEALANTS

A. Polyurethane-based sealant, Sika Sikaflex 1A, or approved equal, meeting Fed. Spec. TT-S- 00230C, Type II, Class A.

2.3 ACCESSORY MATERIALS

A. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

B. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

C. Preformed Compressible and Non-Compressible back-up materials.

1. Polyethylene, Urethane, Neoprene or Vinyl extruded closed cell foam backer rod. Over size backer rod by 30 to 50%.

PART 3 EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the AUTHORITY in writing of conditions detrimental to the proper and timely completion of the Work.

B. Verify joint dimensions and conditions are acceptable to receive the work of this Section.

C. Beginning of installation means acceptance.

3.2 PREPARATION

A. Clean and prepare joints in accordance with manufacturer's instructions. Remove any loose materials and other foreign matter which might impair adhesion of sealant.

B. Apply masking tightly around joints to protect adjacent surfaces from excess sealant.

C. Prime as required by manufacturer for proper bond to substrate materials.

D. Prepare joint to achieve proper sealant width/depth ratios as indicated. Install backer rod where required to achieve correct joint profile.

3.3 INSTALLATION

A. Install sealant in strict accordance with manufacturer's instructions.

B. Sealant beads shall have a section as detailed in the Drawings.

C. Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature ranges.

D. Tool joints concave, unless indicated otherwise. Finish free of air pockets, foreign embedded matter, ridges and sags.

E. Coat finished and cured sealant joints with coating system specified for tanks, see Section 09 97 13.23 – Exterior Steel Coatings.

3.4 CLEANUP

A. Clean adjacent surfaces free of excess sealant as the work progresses. Use cleaning agents recommended by the sealant manufacturer.

B. Upon completion, remove and dispose of masking.

END OF SECTION

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Standard exterior and interior hollow metal doors and frames.

1.2 RELATED REQUIREMENTS

A. Section 08 71 00 Door Hardware.

1.3 SUMBITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, and finishes.

B. Shop Drawings: Include the following:

1. Details of doors. Including vertical and horizontal edge details and metal thicknesses.
2. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
3. Details of anchorages, joints, field splices, and connections.

1.4 DELIVERY, STORAGE, AND HANDELING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.

1. Provide additional protection to prevent damage to finish of factory-finished units.
2. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

PART 2 PRODUCTS

2.1 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

C. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

2.2 HOLLOW METAL DOORS AND FRAMES

A. Exterior and interior doors and frames: Face sheets shall be 16 gauge minimum thickness zinc-coated steel conforming to ASTM A 653/A653M CS Type B, doors and metal frames shall be galvanized and factory primed, Coating Designation A60 or G60.

B. Spray finish all doors and frames with two coats of Sherwin Williams Macropoxy 646, or approved equal, color structural gray 4013.

C. Exterior and interior door cores: Foamed-in-place polyurethane insulation.

D. All doors furnished with tops inverted, caulked, and sealed.

E. Install 24” x 24” insulated re-light with two panes of laminated safety glass in each door.

F. Provide doors and frames in accordance with the dimensions shown in the contract drawings.

PART 3 EXECUTION

1.1 INSTALLATION

A. Install doors and frames in accordance with ANSI/SDI A250.11.

B. Set plumb and level.

C. Secure to adjacent construction using fastener type best suited to application.

D. Install hardware in accordance with Section 08 71 00.

E. Touch-up minor scratches and abrasions in paint to match finish.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Commercial door hardware for exterior and interior hollow metal doors.

1.2 RELATED REQUIREMENTS

A. Section 08 11 13 – Hollow Metal Doors and Frames.

1.1 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, and finishes.

1.2 DELIVERY, STORAGE, AND HANDELING

A. Tag each item or package separately with identification related to the final door hardware sets, and include basic installation instructions, templates, and necessary fasteners with each item or package.

PART 2 PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: provide items indicated for each door to comply with requirements in this section and door hardware sets indicated in Part 3 “Door Hardware Sets” and in accordance with the project drawings.

B. Named Manufactures Products: Provide Manufactures and product designations as listed for each door hardware item specified. Manufacturers other than those listed will need prior approval.

2.2 HINGES

A. Provide three ANSI/BHMA A156.1 certified hinges for each door.

B. Hinge Size: Provide 4.5 inch heavy weight hinges, unless otherwise indicated, with hinge widths sized for door thickness and clearances required.

C. Provide Hager model number BB1191 4.5 x 4.5NRP x 630 Hinges or approved equal.

2.3 LOCK SET

A. Provide Best model 93K7AB x 15D x 626 Lock Set or approved equal.

B. Provide Best Brown Construction Lock Set Core or approved equal.

2.4 LATCH SET

A. Provide Best model 93KON x 15D x 626 Latch Set or approved equal.

2.5 DOOR CLOSER

A. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable back check and separate non-critical valves for closing sweep and latch speed control.

B. Provide LCN model number 4041 x CUSH x 689 Door Closure or approved equal.

2.6 DOOR WEATHER STRIP

A. Provide PEMKO model number 2891AS x 36 or 30 Door “Head” Weather Strip or approved equal.

B. Provide PEMKO model number 2891AS x 80 Door “Jambs” Weather Strip or approved equal.

2.7 DOOR THRESHOLD

A. Provide Hager model number 580S x 36 or 30 Door Threshold or approved equal.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install each door hardware item to comply with manufactures’ written instructions.

B. Set unit level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.

C. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

D. Thresholds: set thresholds for doors in full bed of sealant complying with requirements specified in section 07 92 00 Joint sealants.

3.2 ADJUSTING

A. Initial Adjusting: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended.

B. Door Closures: Unless otherwise required by authorities having jurisdiction. Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

3.3 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.4 DOOR HARDWARE SCHEDULE

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

B. Generator module exterior door hardware sets:

1. Three Hinges.
2. Lock Set and Core.
3. Door Closure.
4. Door Head Weather Strip.
5. Two each door Jamb Weather Strip.
6. Door Threshold.

C. Generator module interior door hardware sets:

1. Three Hinges.

2. Latch Set.
3. Door Closure.
4. Door Head Weather Strip.
5. Two each door Jamb Weather Strip.
6. Door Threshold.

END OF SECTION

SECTION 09 77 00

SPECIAL WALL SURFACING
(GLASS FIBER REINFORCED PLASTIC PANELING)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fiberglass reinforced plastic (FRP) paneling for wall and ceiling surfaces, including trim accessories.

1.2 RELATED REQUIREMENTS

A. Section 13 34 23.13 – Portable and Mobile Buildings.

1.3 REFERENCES

A. ASTM D256 – Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.

B. ASTM D570 – Standard Test Method for Water Absorption of Plastics.

C. ASTM D638 – Standard Test Method for Tensile Properties of Plastics.

D. ASTM D2583 – Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.

E. ASTM D5319 – Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.

F. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

A. Product Technical Data: For each type of product required.

B. Manufacturer’s Instructions: Manufacturer’s Installation Guide for FRP.

C. Qualifications Statements: For manufacturer and installer.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For installed products including maintenance methods and precautions against cleaning materials and methods detrimental to finishes and performance.

1.6 QUALITY ASSURANCE

A. Installer Qualifications:

1. Experience on at least five projects of similar size, type, and complexity as this Project.
2. Employer of workers for this Project who are competent in techniques required by manufacturer for installation indicated.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Package sheets on skids or pallets for shipment to project site.

B. Storage and Handling: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Store panels in a dry indoor location at Project site. Remove any foreign matter from face of panel by using a soft bristle brush, avoiding abrasive action.

1.8 PROJECT CONDITIONS

A. Ambient Conditions:

1. Do not begin installation until building is enclosed, permanent heating and cooling equipment is in operation, and residual moisture from plaster, concrete or terrazzo work has dissipated.
2. During installation, and within 48 hours prior to installation, maintain ambient temperature and relative humidity within limits required by type of panel adhesive used and recommendation of panel adhesive manufacturer.

1.9 WARRANTY

A. Special Warranty: Installer's standard form in which installer agrees to repair or replace FRP panels that fail due to poor workmanship or faulty installation within the specified warranty period.

1. Warranty Period: 1 year from date of Substantial Completion.

PART 2 PRODUCTS

2.1 FIBERGLASS REINFORCED PLASTIC (FRP) PANELS

A. Product: Fiberglass Reinforced Plastic Wall and Ceiling Panels.

1. Color: White
2. Surface Finish: Pebbled embossed texture
3. Nominal Thickness: 0.09 inch (1.9 mm)
4. Wall Panel Size: 4’ x 8’

B. Performance Criteria (Class A Panels):

1. Flexural Strength: 18,000 psi (124 Mpa), ASTM D790.
2. Tensile Strength: 10,000 psi (69 Mpa), ASTM 638.
3. Barcol Hardness: 45, ASTM D2583.
4. Impact Strength (IZOD): 8 ft-lb/sq. in. (0.43 J/mm), ASTM D256, showing no visible damage on finish side.
5. Water Absorption: 0.16 % in 24 hours at 77 deg. F (25 deg. C), ASTM D570.

2.2 ACCESSORIES

A. Moldings, Trim, and Caps: 1-piece extruded Vinyl/PVC or Polypropylene, configured to cover panel edges and corners.

B. Rivets Color: Match FRP panels.

C. Panel Adhesive: As recommended by panel manufacturer for the required substrates.

PART 3 EXECUTION

3.1 GENERAL

A. Comply with manufacturer’s product data, including product technical bulletins and installation instructions in product catalogs and product packaging.

B. Verify that substrates previously installed under other sections are acceptable for product installation in accordance with FRP manufacturer’s instructions.

1. Examine substrate surfaces to determine that corners are plumb and straight; that surfaces are smooth, sound, and uniform; that nails or screw fasteners are countersunk; and that joints and cracks are filled flush and smooth with adjoining surfaces.
2. Do not begin panel installation until substrate surfaces are in satisfactory condition.

3.2 PREPARATION

A. Clean substrates to remove substances that could impair bond of adhesive including oil, grease, dirt, dust, or other contamination.

B. Condition panels by unpacking and placing in installation space no less than 24 hours before installation.

C. Lay out paneling before beginning installation. Locate panel joints to provide equal panel widths at ends of walls and so that trimmed panels at corners are not less than 12 inches (300 mm) wide.

3.3 INSTALLATION

A. Comply with panel manufacturer's installation guide.

B. Cut and drill panels finished face down, with carbide tipped saw blades or drill bits, or cut with snips.

C. Install panels with manufacturer's recommended gap for panel field and corner joints.

1. Pre-drill fastener holes in panels, 1/8 inch (3.2 mm) greater in diameter than fastener.
2. Install panels in a full spread of adhesive. For trowel type and application of adhesive, follow adhesive manufacturer's recommendations.

D. Install trim accessories with adhesive and nails or staples. Do not fasten through panels.

E. Sealant:

1. Fill grooves in trim accessories with sealant before installing panels and bed inside corner trim in a bead of sealant.
2. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths.

3.4 CLEANING

A. Remove temporary coverings and protection of adjacent work areas.

B. Repair or replace any installed products that have been damaged.

C. Clean installed panels in accordance with manufacturer's instructions prior to AUTHORITY'S acceptance.

D. Remove and lawfully dispose of construction debris from project site.

3.5 PROTECTION

A. Protect installed product and finish surfaces from damage during construction.

END OF SECTION

SECTION 09 96 00

HIGH-PERFORMANCE COATINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide and install an impervious corrosion-resistant paint coating system for all interior steel surfaces and exterior steel wall penetration.

B. Provide and install touch up paint as need on exterior steel surfaces.

C. Provide and install paint coating system for all interior wood surfaces.

1.2 RELATED REQUIREMENTS

A. Section 01 33 00 – Submittal Procedures.

B. Section 13 34 23.13 – Portable and Mobile Buildings.

1.3 SUBMITTALS

A. No later than one week after the Award and Notice to Proceed, submit manufacturer's instructions for the paint system.

B. Provide product certifications stating that the products intended for use meet the standards of this specification.

1.4 QUALITY ASSURANCE

A. All steel coating components shall be rated for the following service conditions:

1. Fluid: Diesel Fuel.
2. Operating Temperature Range: -50°F to +120°F.

PART 2 PRODUCTS

2.1 MATERIALS

A. General: All products submitted shall conform to federal, state, and local requirements limiting the emission of volatile organic compounds. Specific information may be secured through the local office of the Air Pollution Control Officer.

B. Color Pigments: Pure, non-fading, applicable types to suit the substrates and service indicated.

C. Paint Coordination: Provide finish coats that are compatible with prime paints used. Review other sections of these Specifications in which prime paints are to be provided to ensure compatibility. Provide barrier coats over incompatible primers or remove and reprime as required. Notify the Engineer in writing of any anticipated problems arising from using specified coating systems with substrates primed by others.

D. Material Quality:

1. Provide the best quality grade of the various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying the manufacturer's identification as a standard, best grade product will not be acceptable. Proprietary names used to designate colors or materials are not intended to imply that products of the named manufacturers are required to the exclusion of equivalent products of other manufacturers, but are used to establish the intended finish type and quality. Equivalent products of other manufacturers may be used upon proper submittal and acceptance; however, proof of replacement materials being readily available at future dates from established, nationally-recognized sources is required.

2. Provide undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only within recommended limits.

E. For module interior wood surfaces:

1. Prime and Finish with two coats: Sherwin Williams Macropoxy 646 (8 mils DFT), or approved equal.
2. All Coats shall be grey 4031.

F. All previously painted interior surfaces:

1. Top Coat: Sherwin Williams Macropoxy 646 (2-3 mils DFT), or approved equal.
2. Top coat color shall be grey 4031.

G. All previously painted connex side exterior vertical surfaces that will not be covered with metal siding:

1. Apply paint at a minimum 12 inches beyond vertical areas uncovered by metal siding.
2. Top Coat: Sherwin Williams Macropoxy 646 (2-3 mils DFT), or approved equal.
3. Top Coat color shall be grey 4031.

H. For module steel containment floor and all exterior wall penetrations:

1. Prime and Finish with two coats: Sherwin Williams Macropoxy 646 (8 mils DFT), or approved equal.
2. All Coats shall be grey 4031.

PART 3 EXECUTION

3.1 GENERAL

A. Protect, ship, and apply paint in accordance with the manufacturer's instructions.

B. Remove all moisture, dust, loose material, and grit prior to masking.

C. Neatly mask all surfaces not required to be painted. Remove, mask, or otherwise protect hardware, lighting fixtures, switch plates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be painted. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process. Openings in motors shall be masked to prevent paint and other materials from entering the motors.

D. Paint shall not be applied in temperatures exceeding the manufacturer's recommended maximum and minimum allowable, nor in dust, smoke-laden atmosphere, damp or humid weather.

E. Apply water-base paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50 degrees F and 90 degrees F, unless otherwise permitted by the paint manufacturer's printed instructions.

F. Apply solvent-thinned paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 45 degrees F and 95 degrees F, unless otherwise permitted by the paint manufacturer's printed instructions.

G. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instructions.

H. Painting may be continued during inclement weather, only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.

I. Do not apply paint materials when temperature and humidity conditions can reasonably be predicted to change from manufacturer's application limitations prior to the elapse of adequate drying time.

4 PREPARATION OF SURFACES

A. General:

1. Perform preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified for each particular substrate condition.

2. Remove all hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish painted; or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary for the complete painting of the items and adjacent surfaces. Following completion of painting of each space or area, reinstall the removed items by workers skilled in the trades involved.

3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program the cleaning and painting so that contaminants from the cleaning process will not fall onto wet, newly-painted surfaces.

B. Preparation of Structural Steel Surfaces:

1. Minimum surface preparation shall be Commercial Blast Cleaned per SSPC-SP6. Remove all oil and grease in accordance with the Solvent Cleaning requirements outlined in this section. Surface preparation for field welding shall be in accordance with SSPC-SP11.

2. Coating Time: Coat any bare steel within 8 hours or before flash rusting occurs.

3. Sharp edges, surface defects, or protrusions shall be ground flat and smooth. Any welded areas shall be sanded before painting.

C. Preparation of Existing Coated Surfaces:

1. All previously painted interior and exterior steel surfaces, Sand blast surfaces to SSPC-3 standards. Loose, abraded, or damaged coatings shall be cleaned to substrate by Hand or Power Tool, SSPC-SP2 or SSPC-SP3. Surrounding intact coating shall be feathered. One spot coat of the specified primer shall be applied to bare areas overlapping the prepared existing coating. One full finish coat of the specified primer or finish coat(s) shall be applied overall.

2. In the case of an application of a cosmetic coat the exact nature of the existing coatings is not known in all cases; and, while it is assumed that they have oxidized sufficiently to prevent lifting or peeling when over coated with the paints specified, the compatibility shall be checked by application

to a small area prior to starting the painting. If lifting or other problems occur, request disposition from the Engineer.

4.1 APPLICATION OF PAINT

D. General:

1. Manufacturer's written instructions for applying each type of paint or protective coating shall be furnished to the Engineer prior to application. Cleaned surfaces and all coats shall be inspected prior to the succeeding coat. Schedule such inspection with the Engineer in advance. Apply all coatings in strict accordance with the paint manufacturer's recommendations, as reviewed by the Engineer. Sufficient time shall be allowed between coats to assure thorough drying of previously applied paint.

2. Apply additional coats when undercoats, stains, or other conditions show through the final coat of paint until the paint film is of uniform finish, color, and appearance. Give special attention to ensure that all surfaces including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

E. Application:

1. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.

2. Paint the back sides of access panels and removable or hinged covers, locker doors, etc., to match the exposed surfaces.

3. Finish exterior doors and frames, on tops, bottoms, and side edges, the same as the exterior faces, unless otherwise indicated.

4. Use foam brushes or rollers on metal doors and frames and similar surfaces to achieve finishes that are completely void of brush stroke tracks and marks.

5. Back-brush inside surfaces of siding, trim, and miscellaneous wood prior to installation and painting when necessary to avoid material cupping or warping.

6. Units to be bolted together and to structures shall be painted prior to assembly or installation.

F. Film Thickness:

1. Coverage is listed as either total minimum dry film thickness in mils (MDFT) or the spreading rate in square feet per gallon (SFPG). Per coat determinations are listed as MDFTPC or SFPGPC. The number of coats is the minimum required irrespective of the coating thickness. Additional coats may be required to obtain the minimum required paint thickness, depending on method of application, differences in manufacturers; products, and atmospheric conditions. Maximum film build per coat shall not exceed the coating manufacturer's recommendations.

2. Metal and wood surfaces shall be visually inspected to ensure proper and complete coverage has been attained.

3. Particular attention shall be given edges, angles, flanges, etc. Where insufficient film thicknesses are likely to be present, ensure proper millage in these areas.

G. Damaged Coatings:

1. Damaged coatings, pinholes, and holidays shall have the edges feathered and repaired in accordance with the recommendations of the paint manufacturer, as reviewed by the Engineer.

2. Repair of fusion bonded coatings to be as recommended by the original applicator. Liquid repair kits to be provided for this purpose by the applicator, as recommended by the coating manufacturer.

3. All finish coats, including touch-up and damage-repair coats shall be applied in a manner which will present a uniform texture and color-matched appearance.

H. Unsatisfactory Application:

1. If the item has an improper finish color, or insufficient film thickness, the surface shall be cleaned and top coated with the specified paint material to obtain the specified color and coverage. Specific surface preparation information to be secured from the coating manufacturer and the Engineer.

2. All visible areas of chipped, peeled, or abraded paint shall be hand- or power-sanded feathering the edges. The areas shall then be primed and finish coated in accordance with the Specifications. Depending on the extent of repair and its appearance, a finish sanding and topcoat may be required by the Engineer.

3. Work shall be free of runs, bridges, shiners, laps, or other imperfections. Evidence of these conditions shall be cause for rejection.

4. Any defects in the coating system shall be repaired by the Contractor per written recommendations of the coating manufacturer.

5. Leave all staging up until the Engineer has inspected the surface or coating. Staging removed prior to approval by Engineer shall be replaced.

4.2 REPAINTING AND TOUCH-UP

A. As directed by the Project Engineer, wire brush to bare metal, and re-paint any areas with imperfections, sags, runs, blushing, blemishes, holidays, thin spots. Surface preparation for touch-up paint of field-welded surfaces shall be in accordance with SSPC-SP11.

B. Touch-up any minor nicks, scratches with same material following the manufacturers written instructions.

C. Repainting and touchup shall be at no additional cost to the AUTHORITY.

END OF SECTION

SECTION 09 98 00

HOT DIP GALVANIZED COATING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Structural steel framing members and support members.

B. Plates and fabricated connections.

1.2 WORK INCLUDED

A. Work includes providing all labor, equipment, plant, transportation, supplies, materials, and engineering to provide galvanized coatings on all steel members, sections, fabricated assemblies, and hardware specified on the Plans.

B. This specification applies to but is not limited to:

1. Structural Steel Fabrications where noted on the plans.

2. Fencing components (See Section 02830 Chain link Fence and Gates).

3. Nuts, bolts, washers, exposed to the atmosphere, except where stainless steel is specified.

4. All other components exposed to the atmosphere and not specified as painted.

1.3 RELATED REQUIREMENTS

A. Section 01 33 00 – Submittal Procedures.

B. Section 05 12 00 – Structural Steel Framing.

C. Section 09 96 00 – High Performance Coatings.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures.

B. No later than 3 weeks prior to galvanizing, submit an electronic copy of a Certificate of Compliance which states that all galvanizing complies with ASTM A 123 or A 153 as appropriate, and the requirements set forth herein.

1.5 QUALITY ASSURANCE

A. Inspection shall be carried out at the galvanizer's plant by a Contractor's representative, or at some other place as agreed between Contractor, fabricator and galvanizer. The Authority reserves the right to reject unacceptable galvanizing at the Project site. Inspection rights and privileges, procedures, and acceptance or rejection of galvanized steel material shall conform to ASTM A 123 or A 153 as applicable. Inspections and tests shall include the following:

1. Visual examination of samples and finished products.

2. Tests to determine weight or mass of zinc coating per square foot of metal surface.

PART 2 PRODUCTS

2.1 MATERIALS

A. Zinc for galvanizing shall conform to ASTM B 6.

B. Structural steel shall be fabricated generally in accordance with Class (I, II, or III) guidelines as shown in Recommended Details for Galvanized Structures as published by the American Hot Dip Galvanizers Association, Inc.

C. Fabrication practices for products to be galvanized shall be in accordance with the applicable portions of ASTM A 143, A 384 and A 385, except as specified herein. Care shall be taken to avoid fabrication techniques which could cause distortion or embrittlement of the steel. Before fabrication proceeds, the Project Manager shall be notified of potential warpage problems which may require modification in design.

D. All welding slag and burrs shall be removed prior to delivery to the galvanizer.

E. Holes and/or lifting lugs to facilitate handling during the galvanizing process shall be provided at positions as agreed between the designer, fabricator, and galvanizer.

F. Unsuitable marking paints shall be avoided and unwanted grease, oil, paint, and other deleterious material shall be removed prior to fabrication.

G. Surface contaminants and coatings which would not be removable by the normal chemical cleaning process in the galvanizing operation shall be removed by the fabricator using blast cleaning or some other method.

2.2 SURFACE PREPARATION

A. Surfaces to be galvanized shall be pre-cleaned utilizing a caustic bath, acid pickle and flux. Alternatively, the steel shall be near white blast cleaned to SPCC – SP10 and fluxed.

2.3 GALVANIZING

A. Steel members, fabrications, and assemblies shall be galvanized after fabrication, but prior to shipment, by the hot dip process in accordance with ASTM A 123.

B. Bolts, nuts, washers, and iron and steel hardware components shall be galvanized in accordance with ASTM A 153. Nuts and bolts shall be supplied in accordance with ASTM A 307, A 325, A 394 and A 563, as applicable.

C. Products shall be safeguarded against steel embrittlement in conformance with ASTM A 143.

D. All articles to be galvanized shall be handled in such a manner as to avoid any mechanical damage and to minimize distortion.

E. Design features which may lead to difficulties during galvanizing shall be pointed out prior to dipping.

F. The composition of metal in the galvanizing bath shall not be less than 98% zinc.

2.4 COATING REQUIREMENTS

A. Weight: The weight and thickness of the galvanized coating shall conform with paragraph 6.1 of ASTM A 123 or Table 1 of ASTM A 153, as appropriate.

B. Surface Finish: The galvanized coating shall be continuous, adherent, as smooth and evenly distributed as possible and free from any defect that is detrimental to the stated end use of the coated article.

C. The integrity of the coating shall be determined by visual inspection and coating thickness measurements.

D. Where slip factors are required to enable friction grip bolting, these shall be obtained after galvanizing by suitable treatment of the faying surfaces in accordance with the latest edition of the Specification for Structural Joints Using ASTM A 325 or A 490 Bolts as approved by the Research Council on Structural Connections of the Engineering Foundation.

E. Adhesion: The galvanized coating shall be sufficiently adherent to withstand normal handling during transport and erection.

2.5 WELDING

A. Where galvanized steel is to be welded, adequate ventilation shall be provided. If adequate ventilation is not available, supplementary air circulation shall be provided. In confined spaces a respirator shall be used.

B. Welding shall be performed in accordance with the American Welding Society publication D19.0-72, Welding Zinc Coated Steel.

C. All uncoated weld areas shall be touched up.

2.6 TOUCH UP AND REPAIR

A. Mechanical Damage

Areas damaged by welding, flame cutting, or during handling, transport or erection shall be repaired by one of the following methods whenever the damage exceeds 3/16" in width:

1. Cold Galvanizing Compound

a. Surfaces to be reconditioned with zinc-rich paint shall be clean, dry, and free of oil, grease and corrosion products.

b. Areas to be repaired shall be power disc sanded to bright metal. To ensure that a smooth reconditioned coating can be effected, surface preparation shall extend into the undamaged galvanized coating.

c. Touch-up paint shall be an organic cold galvanizing compound having a minimum of 94% zinc dust in the dry film.

d. The paint shall be spray or brush applied in multiple coats until a dry film thickness of 8 mils minimum has been achieved. A finish coat of aluminum paint shall be applied to provide a color blend with the surrounding galvanizing.

e. Coating thickness shall be verified by measurements with a magnetic or electromagnetic gauge.

2. Zinc Based Solder

a. Surfaces to be reconditioned with zinc-based solder shall be clean, dry and free of oil, grease and corrosion products.

b. Areas to be repaired shall be wire brushed.

c. Heat shall be applied slowly and broadly close to, but not directly onto the area to be repaired. The zinc-based solder rod shall be rubbed onto the heated metal until the rod begins to melt. A flexible blade or wire brush shall be used to spread the melt over the area to be covered. The zinc based solder shall be applied in a minimum thickness of 2 mils.

d. Coating thickness shall be verified by measurements with a magnetic or

electromagnetic gauge.

B. Wet Storage Stain

Any wet storage stain shall be removed by the galvanizer if formed and discovered prior to leaving the galvanizer's plant. Wet storage stain shall be removed before installation so that premature failure of the coating will not occur. Wet storage stain shall be removed as follows:

1. The objects shall be arranged so that their surfaces dry rapidly.

2. Light deposits are to be removed by means of a stiff bristle (not wire) brush. Heavier deposits are to be removed by brushing with a 5% solution of sodium or potassium dichromate with the addition of 0.1% by volume of concentrated sulfuric acid. This is to be applied with a stiff bristle brush and left for about 30 seconds before thoroughly rinsing and drying. Alternatively a proprietary product such as Oakite Highlite, or equal, which is intended for this purpose, may be used according to manufacturer’s recommendations.

3. A coating thickness check must be made in the affected areas to ensure that the zinc coating remaining after the removal of wet storage stain is sufficient to meet or exceed the requirements of the specification.

END OF SECTION

SECTION 10 44 16.13

PORTABLE FIRE EXTINGUISHERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fire extinguishers at locations indicated in the project drawings.

1.2 REFERENCES

A. UL "A" Building Materials Directory.

B. NFPA No. 10 Fire Extinguishers, Portable.

C. NFPA No. 30 Flammable and Combustible Liquid Code.

PART 2 PRODUCTS

2.1 EXTINGUISHERS

A. Manufacturer: Larsen's Manufacturing Co., 7421 Commerce Lane, N.E., Minneapolis, MN 55432, (612) 571-1181, or approved equal.

B. Extinguisher shall have a minimum rating of 3-A, 40-B:C and a 20 lb. capacity. Fire rating in accordance with NFPA No. 10 and No. 30.

1.	Gasoline Fires:	Class III Hazard; BC.
2.	Fuel Oil Fires:	Class II Hazard; BC.
3.	Wood, Paper and All Above:	Class I, II, or III; ABC.

C. Extinguisher Brackets: Larsen's Manufacturing Co., bottom support, quick release strap-buckle type.

PART 3 EXECUTION

3.1 INSTALLATION

A. Mount top of extinguishers 3 to 4 feet above ground, pavement, or floor.

B. Fasten extinguisher brackets securely to structure. Provide additional brackets, uni-strut, fasteners, and components as required. All miscellaneous hardware shall be hot dip galvanized.

END OF SECTION

SECTION 13 43 23.13

PORTABLE AND MOBILE BUILDINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This section includes fabrication of ISO (International Organization of Standardization) Conex shipping container, as shown in the contract Drawings.

1.2 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification. Apply to this section.

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00.

1. Manufacturer’s product data or specification and installation instructions.

1.4 REFERENCE STANDARDS

A. ISO Conex container shall conform to and satisfy the following regulations and standards:

1. ISO 830 – Freight containers – Terminology.

2. ISO 668 – Series 1 freight containers – Classification external dimensions and ratings.

3. ISO 1161 – Series 1 freight containers – Corner fittings Specification.

4. ISO 1496-1 – Series 1 freight containers – Specification and testing. Part 1: General cargo containers for general purposes.

5. ISO 1894 – General purpose series 1 freight containers – Minimum internal dimensions.

6. ISO Conex container shall comply with the customs convention of containers, 1972 and all subsequent revisions to date.

1.5 DELIVERY, STORAGE, AND HANDLING

A. ISO Conex container shall be constructed to be handled under the following conditions without distortion of effect on its structural integrity:

1. Lifting full by its top corner fittings by means of spreaders.
2. Lifting full by its bottom corner fittings by means of a sling angle of 30 degrees.
3. Lifting full at forklift pockets.

PART 2 PRODUCTS

2.1 DIMENSIONS

ISO Conex Container Dimensions		
Title		40'High Cube
External	Length	40'
	Width	8'
	Height	9'-6"
Internal	Length	39'-5"
	Width	7'-8"
	Height	8'-10"
Door opening	Width	7'-8"
	Height	8'-5 ½"

2.2 LOAD RATING

A. Maximum gross connex weight: 67,200 LBS.

B. Maximum connex payload: 58,600 LBS.

2.3 MATERIALS

PART	MATERIALS
Roof Panels Door Panels Side Panels Front Panels Bottom Side Rails Cross Members Upper and Lower Plates of Forklift Pockets Rear Corner Posts (Outer) Door Sill Door Header Door Horizontal Frames Door Vertical Frames Top Side Rails Front Corner Posts Front Bottom End Rail Front Top End Rail	Anti-Corrosive Steel: CORTEN A, SPA-H, B480 or equivalent Y.P. : 35 kg/sq. mm T.S. : 49 kg/sq. mm
Rear Corner Posts Inner	Rolled high tensile steel: SM490A or equivalent Y.P. : 33 kg/sq. mm
Floor Center Rail	Structural Steel: SS400 Y.P. : 25 kg/sq.mm T.S. : 41 kg/sq.mm
Door Locking Bars	Structural steel round pipe: STK41 Y.P. : 24 kg/sq. mm T.S. : 41 kg/sq. mm
Corner Fitting	Casted weldable steel: SCW480 Y.P. : 28 kg/sq. mm T.S. : 49 kg/sq. mm
Door Hinge Pins	300 series Stainless Steel
Door Gaskets	EPDM
Floor Boards	Hardwood Plywood, 19 ply.

2.4 FABRICATION

A. Conex shall be a “one-trip” or “like-new” ISO container.

1. There shall be no rips, holes, gashes, or other damages to the connex.
2. Conex doors shall operate freely without binding or excessive resistance.
3. Conex exterior shall have no rust.
4. Only double door units are acceptable.
5. Conex shall be lockable.

B. The container shall be constructed with steel frames, corrugated panels welded by CO_2 shielded Arc welding. All welds of the exterior including the base frames shall be continuous with full penetration. Wooden floor shall be fixed to the cross members by self-tapping screws. All crevices shall be sealed with elastic sealing compound

PART 3 EXECUTION

3.1 EXAMINATION

A. The connex shall be inspected by AUTHORITY, or AUTHORITY'S representatives, and accepted before beginning module fabrication.

END OF SECTION

SECTION 23 05 00

COMMON WORK RESULTS FOR MECHANICAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Painting and marking.
2. Valve tags, signs, and placards.
3. General mechanical work.

1.2 SCOPE

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

1.3 WORK INCLUDED

A. The work to be included in these and all other mechanical subsections shall consist of providing, installing, adjusting and setting into proper operation complete and workable systems for all items shown on the drawings, described in the specifications or reasonably implied. This shall include the planning and supervision to coordinate the work with other crafts and to maintain a proper time schedule for delivery of materials and installation of the work.

B. Division 1 of the specifications is to be specifically included as well as all related drawings.

1.4 RELATED WORK

A. Related Work Specified Elsewhere:

1. Electrical Specifications: Division 26

B. Unless otherwise indicated on the electrical drawings and schedules, provide all mechanical equipment motors, motor starters, thermal overload switches, control relays, time clocks, thermostats, motor operated valves, float controls, damper motors, electrical components, wiring and any other miscellaneous Division 23 controls. Disconnect switches are included in the electrical work, unless specifically called out on mechanical Drawings or furnished as part of the mechanical equipment.

C. Carefully coordinate all work with the electrical work shown and specified elsewhere.

1.5 PROJECT RECORD DRAWINGS

A. In addition to other requirements of Division 1, mark up a clean set of drawings as the work progresses to show the dimensioned location and routing of all mechanical work which will become permanently concealed. Show routing of work in concealed blind spaces within the building.

B. Provide one set of drawings clearly marked up with all as-built information to the Authority within two weeks of completion.

C. At completion of project, deliver these drawings to the Authority and obtain a written receipt.

1.6 SUBMITTALS

A. Provide submittals for all products and systems described in Division 23 specifications and shown on the Drawings to demonstrate compliance with the requirements of the project. Provide submittals in the manner described herein and in Division 1.

B. Painting and Marking: Submit manufacturers catalog literature for each product required.

C. Valve Tags: Submit manufacturers catalog literature for tags as indicated on the Schedule on Sheet M1.1.

D. Signs and Placards: Submit manufacturers catalog literature as indicated on the Schedule on Sheet M1.2.

E. Equipment: Submit manufacturers catalog literature for each item indicated on the Mechanical Schedules on Sheet M1.1 under the Division 23 Sections that follow. See specific requirements under each section.

1.7 RECEIVING AND HANDLING

A. See general conditions and the general requirements in Division 1 regarding material handling.

B. Deliver packaged materials to the jobsite in unbroken packaging with manufacturer's label, and store to facilitate inspection and installation sequence.

C. Protect all materials and equipment during the duration of construction work against contamination and damage. Replace or repair to original manufactured condition any items damaged during construction. Immediately report any items found damaged to the Authority prior to commencing construction.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Division 1 - Material and Equipment: Storage and protection.

1.9 QUALITY ASSURANCE

A. Division 1 - Quality Control

B. Perform all work in accordance with the latest adopted editions of the International Fire Code, the International Building Code, and the International Mechanical Code including State of Alaska amendments. Comply with all applicable State and Federal regulations.

C. Perform work with skilled craftsman specializing in said work. Install all materials in a neat and orderly, and secure fashion as required by specifications and commonly recognized standards of good workmanship.

1.10 SCHEDULE OF WORK

A. The work must be expedited and close coordination will be required in executing the work. The various trades shall perform their portion of the work at such times as directed so as to meet scheduled completion dates, and to avoid delaying any other trade.

B. The Authority will set up completion dates. Each Contractor shall cooperate in establishing these times and locations and shall process his work so as to ensure the proper execution of it.

1.11 SUBSTANTIAL COMPLETION

A. Contact the Authority one week prior to completion of all work to schedule substantial completion inspection. The Authority will generate a punchlist of corrective action items during the inspection. Work will not be considered complete until all corrective action items in the Authority's punch list have been satisfactorily completed and photographic or other positive documentation has been provided to the Authority.

1.12 COOPERATION AND CLEANING UP

A. The Contractor for the work under each section of the specifications shall coordinate his work with the work described in all other sections of the specifications, and shall carry on his work in such a manner that none of the work under any section of these specifications shall be handicapped, hindered or delayed at any time.

B. At all times during the progress of the work, the Contractor shall keep the premises clean and free of unnecessary materials and debris. The Contractor shall, on direction at any time from the Authority, clear any designated area or areas of materials and debris. On completion of any portion of the work, the Contractor shall remove from the premises all tools and machinery and all debris occasioned by the work, leaving the premises free of all obstructions and hindrances.

1.13 SPECIAL CONDITIONS

A. Ensure that the appropriate safety measures are implemented and the all workers are aware of the potential hazards from electrical shock, burn, rotating fans, pulleys, belts, hot manifolds, noise, etc. associated with working near power generation and control equipment.

1.14 WARRANTY

A. Division 1 - Closeout Requirements: Warranties.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Provide all equipment and materials required for a complete system.

B. All equipment and materials supplied under this Contract are new unless specifically indicated as existing. Where additional or replacement items are required, provide like items by the same manufacturer to the maximum extent practical.

C. Install all material and equipment in accordance with manufacturer's installation instructions and recommendations unless specifically indicated otherwise.

2.2 PAINTING

A. Carbon Steel Pipe - Paint all exposed carbon steel pipe that is not insulated except for engine exhaust. Wire brush and wipe down with solvent. Prime and finish with two coats of with direct to metal alkyd enamel, Sherwin Williams DTM or approved equal, color Structural Gray 4031.

B. Paint all steel fabrications and tanks. Sandblast or wire brush to bare metal and wipe down with solvent. Prime and finish with two coats of self-priming epoxy, Sherwin Williams Macropoxy 646 or approved equal, color Structural Gray 4031.

C. Touch-up – finish all cut ends and damaged surfaces of galvanized and zinc plated supports and fasteners with spray on Cold Galvanizing Compound, ZRC or approved equal. Touch up paint on fabricated items to match original.

2.3 MARKING

A. Install flow arrows on diesel fuel and coolant piping using same color scheme as pipe painting. Black arrows over colored backgrounds, self-adhesive vinyl, Seton arrows on roll or approved equal. On insulated piping install flow arrows over jackets.

2.4 VALVE TAGS

A. Specific Function Valve Tags – For all valves marked with a specific function, provide color coded tags worded as indicated on the schedules. Install as noted.

B. Standard Valve Tags – For all valves not marked with a specific function, provide NO/NC tags as indicated on the schedules. Install as noted.

2.5 SIGNS AND PLACARDS

A. Provide decals and sign boards, color coded and worded as indicated on the schedules. Install as noted.

PART 3 - EXECUTION

3.1 DRAWINGS

A. The mechanical drawings are generally diagrammatic and do not necessarily show all features of the required work. Provide all equipment and materials required for a complete system. Complete details of the building which affect the mechanical installation may not be shown. For additional details, see Civil, Architectural, Structural, and Electrical Drawings. Coordinate work under this section with that of all related trades.

B. Contractor to field verify all dimensions and conditions prior to start of construction. Immediately contact the Authority for clarification of questionable items or apparent conflicts.

3.2 CUTTING, FITTING, REPAIRING, PATCHING, AND FINISHING

A. Where previously completed building surfaces or other features must be cut, penetrated, or otherwise altered, such work shall be carefully laid out and patched to the original condition. Perform work only with craftsmen skilled in their respective trades.

B. Do not cut, drill, or notch structural members unless specifically approved by the Authority. Minimize penetrations and disruption of building features.

C. Seal all exterior ceiling and wall penetrations as indicated.

3.3 EXAMINATION

A. Check materials for damage that may have occurred during shipment. Repair damaged materials as required or replace with new materials.

3.4 INSTALLATION OF EQUIPMENT

A. Check materials for damage that may have occurred during shipment. Repair damaged materials as required or replace with new materials

B. Unless otherwise indicated, support all equipment and install in accordance with manufacturer's recommendations and approved submittals.

C. Maintain manufacture recommended minimum clearances for access and maintenance.

D. Where equipment is to be anchored to structure, furnish and locate necessary anchoring and vibration isolation devices.

E. Furnish all structural steel, such as angles, channels, beams, etc. required to support all piping, ductwork, equipment and accessories installed under this Division. Use structural supports suitable for equipment specified or as indicated. In all cases, support design will be based upon data contained in manufacturer's catalog.

F. Openings: Arrange for necessary openings in buildings to allow for admittance and reasonable maintenance or replacement of all apparatus furnished.

3.5 SCOPE OF ISOLATION AND RESTRAINT WORK

A. All vibrating equipment and the interconnecting pipe and ductwork shall be isolated to eliminate the transmission of objectionable noise and vibration from the structure.

B. Mechanical equipment shall be carefully checked upon delivery for proper mechanical performance, which shall include proper noise and vibration operation.

C. All installed rotating equipment with excessive noise and/or vibration, which cannot be corrected in place, shall be replaced at no cost to the Authority.

END OF SECTION

SECTION 23 05 29

HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipe hangers and supports.
2. Hanger rods.
3. Flashing.
4. Sleeves.
5. Formed steel channel.

B. Related Sections:

1. Section 23 05 00 – Common Work Requirements for Mechanical.
2. Section 23 21 13 - Hydronic Piping: Execution requirements for placement of hangers and supports specified by this section.
3. Section 23 11 13 - Fuel and Lube Oil Piping: Execution requirements for placement of hangers and supports specified by this section.

1.2 REFERENCES

A. American Society of Mechanical Engineers:

1. ASME B31.1 - Power Piping.
2. ASME B31.9 - Building Services Piping.

B. ASTM International:

1. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
2. ASTM E814 - Standard Test Method for Fire Tests of Through Penetration Fire Stops.
3. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.
4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.

C. American Welding Society:

1. AWS D1.1 - Structural Welding Code - Steel.

D. Manufacturers Standardization Society of the Valve and Fittings Industry:

1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
2. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.

3. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.

1.3 SUBMITTALS

A. Provide submittals for all products and systems described herein. Provide in accordance with the requirements of Section 23 05 00 - Common Work Results for Mechanical and Division 1.

B. Product Data: Hangers and Supports: Submit manufacturers catalog data including load capacity. Indicate finish for interior and exterior applications.

C. Design Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers. Indicate calculations used to determine load carrying capacity of trapeze, multiple pipe, and riser support hangers.

1.4 QUALITY ASSURANCE

A. Division 1 – Quality Control

B. Conform to applicable code for support of coolant and hydronic piping.

C. Perform Work in accordance with State of Alaska Standards.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing Work of this section.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

B. Protect from weather and construction traffic, dirt, water, chemical, and damage, by storing in original packaging.

1.7 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS

A. Manufacturers:

1. Anvil, B-line, Grinnell, or approved equal.

2. Division 1 - Product Options and Substitutions.

2.2 FLASHING AND SEALING

A. Caps & Coverings: Steel, 16 gauge minimum.

B. For penetration of all interior wall penetrations seal with polyurethane caulking.

C. For piping smaller than 2" through exterior walls seal with polyurethane caulking.

D. For piping 2" and larger through exterior walls install flashing as indicated on Drawings. Oatey Master Flash or approved equal.

2.3 STRUCTURAL STEEL

A. Miscellaneous shapes and plate: ASTM A-36.

B. Rectangular tubing: ASTM A-500 Grade B.

C. Structural Pipe: ASTM A-53 or ASTM A-106B.

D. Paint as indicated.

2.4 FORMED STEEL CHANNEL

A. Strut: Cold formed mild steel channel strut, pre-galvanized finish and slotted back unless specifically indicated otherwise.

B. Standard Strut: 12 gauge thick steel, 1-5/8" x 1-5/8", B-line B22-SH-Galv or equal.

C. Double Strut: 12 gauge thick steel, 1-5/8" x 3-1/4", B-line B22A-SH-Galv or equal.

D. Shallow Strut: 14 gauge thick steel, 1-5/8" x 13/16", B-line B54-SH-Galv or equal.

E. Where strut is welded to tanks or structures provided plain (unfinished black) solid back strut: 12 gauge thick steel, 1-5/8" x 1-5/8", B-line B22-PLN or approved equal.

F. On all exterior installations provide hot dip galvanized strut and fittings.

2.5 FITTINGS AND ACCESSORIES

A. Hanger Rods: Continuous threaded rod. Zinc plated carbon steel except for exterior installations provide hot dip galvanized.

B. Provide fittings, brackets, channel nuts, and accessories designed specifically for use with specified channel strut. Zinc plated carbon steel except for exterior installations provide hot dip galvanized.

C. Pipe Clamps: Two piece pipe clamp designed to support pipe tight to strut, B-line B20##, or approved equal, as indicated on the Pipe/Tubing Strut Clamp Schedule on Sheet M1.1. Zinc plated carbon steel except for exterior installations provide hot dip galvanized.

2.6 FASTENERS

A. All bolts, nuts, and washers to be zinc plated carbon steel except on exterior installations provide hot dip galvanized.

2.7 CUSTOM U-BOLT

A. Furnish custom fabricated U-bolts for exhaust pipe support as indicated, Six States Distributors or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Check materials for damage that may have occurred during shipment. Repair damaged materials as required or replace with new materials.

3.2 PREPARATION

A. Obtain permission from the Authority before drilling or cutting structural members.

3.3 INSTALLATION - PIPE HANGERS AND SUPPORTS

A. Support piping and equipment as shown on Drawings using specified supports and fasteners. If not detailed on Drawings, support from structural members with pipe hangers, clamps or pipe straps specifically intended for the application.

B. Independently support pumps and equipment. Supporting piping from connections to equipment shall not be permitted.

C. Support horizontal piping as scheduled.

D. Install hangers with minimum 1/2 inch space between finished covering and adjacent work.

E. Place hangers within 12 inches of each horizontal elbow or as indicated.

F. Use hangers with 1-1/2 inch minimum vertical adjustment.

G. Where piping is installed in parallel and at same elevation, provide multiple pipe or trapeze hangers.

H. Support riser piping independently of connected horizontal piping.

I. Design hangers for pipe movement without disengagement of supported pipe.

J. Provide clearance in hangers and from structure and other equipment for installation of insulation. Refer to Section 23 07 19.

K. For specific piping and equipment support details reference Drawings.

3.4 INSTALLATION - FLASHING

A. Seal and flash all wall penetrations as indicated.

3.5 PROTECTION OF FINISHED WORK

A. Protect adjacent surfaces from damage by material installation.

3.6 SCHEDULES

A. Copper Tube and Steel Pipe Hanger Spacing:

PIPE SIZE Inches	Copper Tube Maximum Hanger Spacing (Ft)	Steel Pipe Maximum Hanger Spacing (Ft)	Copper Tube Hanger Rod Diameter (In)	Steel Pipe Hanger Rod Diameter (In)
1/2 & 3/4	5	7	3/8	3/8
1 & 1-1/4”	6	7	3/8	3/8
1-1/2	8	9	3/8	3/8
2	8	10	3/8	3/8
3	10	10	1/2	1/2
4	12	10	1/2	5/8

END OF SECTION

SECTION 23 07 19

PIPING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Piping insulation, jackets and accessories.
2. Exhaust piping insulation, jackets and accessories.

1.2 RELATED SECTIONS

A. Section 23 05 00 – Common Work Requirements for Mechanical.

B. Section 23 05 29 - Hangers and Supports for Piping and Equipment.

C. Section 23 35 16.10 - Engine Exhaust and Crank Vent Piping.

1.3 REFERENCES

A. ASTM International:

1. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
2. ASTM C450 - Standard Practice for Fabrication of Thermal Insulating Fitting Covers for NPS Piping, and Vessel Lagging.
3. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation.
4. ASTM C585 - Standard Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System).
5. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.

1.4 SUBMITTALS

A. Provide submittals for all products and systems described herein. Provide in accordance with the requirements of Section 23 05 00 - Common Work Results for Mechanical and Division 1.

B. Product Data: Submit product description, thermal characteristics and list of materials and thickness for each service, and location.

C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Division 1 – Quality Control

B. Pipe insulation maximum flame spread index of 25 and maximum smoke developed index of 50 in accordance with ASTM E84.

C. Pipe insulation manufactured in accordance with ASTM C585 for inner and outer diameters.

D. Factory fabricated fitting covers manufactured in accordance with ASTM C450.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section.

B. Applicator: Company specializing in performing work specified in this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

B. Protect insulation from weather and construction traffic, dirt, water, chemical, and damage, by storing in original wrapping.

1.8 ENVIRONMENTAL REQUIREMENTS

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

1.9 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 COOLANT PIPE INSULATION

A. TYPE P-1: ASTM C547, 1" preformed rigid fiberglass pipe insulation. Thermal Conductivity: 0.23 at 75 degrees F. Operating Temperature Range: 0 to 850 degrees F. Vapor Barrier Jacket: ASTM C1136, Type I, factory applied reinforced foil kraft with self-sealing adhesive joints. Jacket Temperature Limit: minus 20 to 150 degrees F. Johns-Manville "Micro-Lok" or approved equal.

B. Cover with aluminum jackets.

2.2 PIPE INSULATION JACKETS

A. Aluminum Pipe Jacket: ASTM B209. Exterior grade, 0.016 inch thick sheet, embossed finish.

B. Fittings: Pre-formed aluminum covers. PABCO or approved Equal.

C. Join with longitudinal slip joints and minimum 2 inch laps.

2.3 EXHAUST PIPE INSULATION

A. Custom Fit Thermal Insulation Pads.
Hot Face Layer: Stainless steel mesh.
Inner Layer: 1" thick ceramic blanket, 2000°F minimum service rating, Thermal Ceramics Kaowool or approved equal.

Mid Layer: 2" thick high temperature fiberglass blanket insulation, 1000°F minimum service rating, Johns-Manville HTB Spin-Glas or approved equal.
Outer layer: Plain weave carmelized fiberglass fabric, 17oz weight, .028" thickness, 1000°F minimum service rating, Alpha-Maritex Style 2025/9383 or approved equal.
All stainless steel closure system including lacing anchors, washers and wire.

B. Wall Penetrations: Where indicated on drawings install TYPE 1 mineral wool fiber batt insulation. Rockwool Safe-N-Sound or approved equal. Fill entire void with insulation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Check materials for damage that may have occurred during shipment. Repair damaged materials as required or replace with new materials.

B. Verify piping has been tested before applying insulation materials.

C. Verify surfaces are clean and dry, with foreign material removed.

D. Verify piping has been painted up to areas to be insulated.

3.2 INSTALLATION - PIPING SYSTEMS

A. Install insulation in accordance with manufacturer's installation instructions.

B. Install insulation where indicated on drawings.

END OF SECTION

SECTION 23 09 00

INSTRUMENTATION AND CONTROL DEVICES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Instrumentation Equipment
2. Pressure gauges.
3. Thermometers.
4. Thermometer thermowell.

1.2 RELATED SECTIONS

A. Section 23 05 00 – Common Work Requirements for Mechanical.

B. Section 23 21 16 - Hydronic Specialties and Equipment.

C. Division 26 - Electrical

1.3 REFERENCES

A. American Society of Mechanical Engineers:

1. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
2. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
3. ASME B40.1 - Gauges - Pressure Indicating Dial Type - Elastic Element.
4. ASME Section VIII - Boiler and Pressure Vessel Code - Pressure Vessels.

B. ASTM International:

1. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
2. ASTM A536 - Standard Specification for Ductile Iron Castings.
3. ASTM B32 - Standard Specification for Solder Metal.
4. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
5. ASTM B280 - Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.
6. ASTM D2737 - Standard Specification for Polyethylene (PE) Plastic Tubing.
7. ASTM E1 - Standard Specification for ASTM Thermometers.
8. ASTM E77 - Standard Test Method for Inspection and Verification of Thermometers.

C. American Welding Society:

1. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.

D. National Electrical Manufacturers Association:

1. NEMA DC 3 - Residential Controls - Electrical Wall Mounted Room Thermostats.
2. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

E. National Fire Protection Association:

1. NFPA 72 - National Fire Alarm Code.
2. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.

1.4 SUBMITTALS

A. Provide submittals for all products and systems described herein. Provide in accordance with the requirements of Section 23 05 00 - Common Work Results for Mechanical and Division 1.

B. Product Data:

1. Submit manufacturers catalog literature including manufacturer's installation instructions for each item indicated on the Instrumentation Equipment Schedule on Sheet M1.1.
2. Submit manufacturer’s catalog literature for all other items specified herein.

1.5 CLOSEOUT

A. Division 1 - Closeout Requirements

B. Project Record Documents: Record actual locations of control components, including panels, thermostats, and sensors.

C. Operation and Maintenance Data: Submit inspection period, cleaning methods, recommended cleaning materials, and calibration tolerances.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section.

B. Installer: Company specializing in performing Work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Accept controls on site in original factory packaging Inspect for damage.

1.8 COORDINATION

A. Coordinate installation of control components in work of Divisions 26 and 33.

PART 2 PRODUCTS

2.1 INSTRUMENTATION EQUIPMENT

A. Provide all equipment and devices as indicated in the Instrumentation Equipment Schedule on Sheet M1.1.

2.2 PRESSURE GAUGES

A. 2-1/2” dial size, dry type, stainless steel case, tube, and socket, 1/4" NPT bottom connection. Range as indicated on Drawings.

B. Range 0-15 psi: Trerice Model 700SS-25-02-L-A-080 or approved equal.

2.3 THERMOMETERS

A. 3” diameter dial, bimetal type, stainless steel case and stem, 1% of full accuracy, adjustable angle and swivel head, 2-1/2” stem length, 20-240^{o}F range dual scale.

B. Trerice B836-02-05 or approved equal.

C. Provide all thermometers with a 3/4" NPT brass thermowell.

PART 3 EXECUTION

3.1 EXAMINATION

A. Check equipment for damage that may have occurred during shipment. Repair damaged equipment as required or replace with new equipment.

B. Verify location of thermostats and other exposed control sensors with Drawings before installation.

C. Verify building systems to be controlled are ready to operate.

3.2 INSTALLATION

A. Install controls and instrumentation where indicated on the Drawings in accordance with manufacturer’s installation instructions.

B. Install gauges and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.

C. Adjust gages and thermometers to final angle, clean windows and lenses, and calibrate.

D. Isolate hydronic pressure gauges during pressure testing.

E. Install conduit and electrical wiring in accordance with Division 26.

F. After completion of installation, test and adjust control equipment.

3.3 DEMONSTRATION AND TRAINING

A. Demonstrate complete operation of systems, including sequence of operation prior to Date of Substantial Completion to the Authority.

END OF SECTION

SECTION 23 11 13

FUEL AND LUBE OIL PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Scope:

1. This section applies to all fuel (oil) piping systems.
2. See Drawings for delineation of work included in this contract.

B. Section Includes:

1. Fuel oil piping.
2. Unions and flanges.
3. Valves.

1.2 RELATED SECTIONS

A. Section 23 05 00 – Common Work Requirements for Mechanical.

B. Section 23 05 29 - Hangers and Supports for Piping and Equipment.

C. Section 23 12 13 - Fuel and Lube Oil Equipment and Specialties.

D. Section 26 32 13 – Engine Generators.

1.3 PERFORMANCE REQUIREMENTS

A. Minimum Working-Pressure Rating: Unless otherwise indicated, minimum pressure requirement for fuel and lube oil piping is 150 psig.

1.4 REFERENCES

A. American Society of Mechanical Engineers:

1. ASME B31.1 - Power Piping.
2. ASME B31.9 - Building Services Piping.
3. ASME B16.5 Flanges and Flanged Fittings
4. ASME B16.9 Factory-Made Wrought Steel Butt welding Fittings
5. ASME B16.11Forged Fittings, Socket-Welding and Threaded
6. ASME Section IX - Boiler and Pressure Vessel Code - Welding and Brazing Qualifications.

B. ASTM International:

1. ASTM A106B – Standard Specification for Seamless Carbon Steel Pipe for High Temperature Services
2. ASME B16.11Forged Fittings, Socket-Welding and Threaded

C. Underwriters Laboratories Inc.:

1. UL 142 – Steel Aboveground Tanks for Flammable and Combustible Liquids.

1.5 SYSTEM DESCRIPTION

A. Provide piping of material as specified in PART 2.

B. Provide flanges, unions, or couplings at locations requiring servicing. Use unions, flanges, or couplings downstream of valves and at equipment connections. Do not use direct welded connections to valves, equipment.

C. Provide pipe hangers and supports per Drawings and specifications.

1.6 SUBMITTALS

A. Provide submittals for all products and systems described herein. Provide in accordance with the requirements of Section 23 05 00 - Common Work Results for Mechanical and Division 1.

B. Product Data:

1. Piping: Submit manufacturers catalog information for pipe materials, fittings, and accessories.

2. Valves: Submit manufacturer's catalog information with valve data and ratings for each service.

3. Hoses: Submit manufacturers catalog information for hose and fittings.

C. Welders' Certificate: Include welders' certification of compliance in accordance with Quality Assurance below.

1.7 CLOSEOUT

A. Division 1 - Closeout Requirements.

1.8 QUALITY ASSURANCE

A. Division 1 – Quality Control.

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

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

D. Perform pipe welding with experienced welder with current API or equivalent certification for all pipe welding in all positions.

1.9 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section.

B. Installer: Company specializing in performing Work of this section with current certification.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Protect piping and fittings from soil and debris with temporary end caps and closures. Maintain in place until installation.

1.11 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 GENERAL

A. Materials shall be new unless otherwise specified. All items of the same type shall be of the same manufacturer.

2.2 PIPE

A. Oil Pipe (DFS, DFR): ASTM A106B seamless black steel pipe, Schedule 80.

B. Vent Pipe: ASTM A53B ERW welded galvanized steel pipe, Schedule 40.

2.3 PIPE FITTINGS

A. Oil Pipe and Fittings shall be full penetration butt welded. Provide ASTM A235 seamless domestic carbon steel butt weld joints and fittings for all pipe 1-1/2 inches in diameter and larger where indicated on plan and specification's. Provide socket weld or threaded joints for all piping smaller than 1-1/2 inches in diameter using ASTM 105 domestic, forged steel fittings, minimum 3000 lb.

B. Flanges shall be ASTM A105 domestic forged steel, ANSI class 150 lbs.

C. Provide flanged connections where indicated on Drawings to allow removal of individual components.

D. Provide spiral wound metallic gaskets and coat with anti-seize compound prior to assembling flanged joints.

E. Perform pipe welding with experienced welder with current API or equivalent certification for pipe welding in all positions.

F. Vent Pipe and Fittings shall have threaded joints with minimum 300# galvanized threaded fittings.

2.4 BALL VALVES

A. Flanged Ball Valves: Reduced port, carbon steel uni-body, ANSI 150# raised face flanged ends, stainless steel ball and trim, TFM seat and PTFE seals for NACE MR0175 service, lockable handle, 150 psig minimum working pressure. PBV C-5410-31-2236-FTNL or approved equal. Note that for a substitute valve to be approved it must be a domestic manufactured high quality industrial valve such as Apollo.

B. Threaded Ball Valves: Carbon steel body, threaded ends, stainless steel ball and trim, PTFE seat and Graphite/PTFE seals for NACE MR0175 service, lockable handle, 150

PSIG minimum working pressure. PBV C-5312-38-2236-TL-NC, PBV C-5322-38-2236-TL-NC or approved equal. Note that for a substitute valve to be approved it must be a domestic manufactured high quality industrial valve such as Apollo.

2.5 CHECK VALVES

A. Threaded Check Valves: Brass body, threaded ends, spring close ball cone check style with soft seat, 150 psig minimum working pressure. Dixon Valve No. 61 or approved equal.

2.6 PRESSURE RELIEF VALVES

A. Threaded Pressure Relief Valves: Bronze body, hard seat, MPT inlet by FPT outlet, size and pressure setting as indicated on the design drawings, Kingston 103SS or approved equal.

2.7 FUSIBLE VALVES

A. Fusible Link Valves: Brass body, FPT ends, 165°F fusible head. Firomatic or approved equal. Size as indicated on Drawings:
1/2" Valve Model #12130, 3/4" Valve Model #12112, 1" Valve Model #12113.

2.8 SOLENOID VALVES

A. Normally Closed Solenoid Valves: Brass body, 1/2" FPT ends, 1/2" NPT conduit connection, 120VAC, stainless steel core, molded epoxy coil enclosure, internal pilot operated, 150 PSI differential opening pressure, liquid tight and full modulation at 0 PSI differential. Asco Catalog No. 8210G94 or approved equal.

B. Normally Open Solenoid Valves: Brass body, 1/2" FPT ends, 1/2" NPT conduit connection, 120VAC, stainless steel core, molded epoxy coil enclosure, internal pilot operated, 150 PSI differential closing pressure, liquid tight and full modulation at 0 PSI differential. Asco Catalog No. 8210G34 or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Check materials for damage that may have occurred during shipment. Repair damaged materials as required or replace with new materials.

3.2 PREPARATION

A. Ream threaded pipe ends. Remove burrs. Thoroughly coat male pipe ends with Hercules Gripp pipe joint compound prior to assembling.

B. Remove scale and dirt, on inside and outside, before assembly.

3.3 INSTALLATION - PIPE HANGERS AND SUPPORTS

A. Install pipe hangers and supports in accordance with Drawings and specifications. Reference Section 23 05 29.

3.4 INSTALLATION - PIPING

A. Route piping in orderly manner and maintain gradient.

B. Install piping to conserve building space and not interfere with use of space.

C. Group piping whenever practical at common elevations.

D. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

E. Prepare pipe, fittings, supports, and accessories not pre-finished, ready for finish painting. Refer to Section 23 05 00.

F. Install identification on piping systems. Refer to Section 23 05 00.

G. Install valves with stems upright or horizontal, not inverted.

H. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

3.5 TESTING

A. Division 1 – Quality Control

B. Test all oil piping with minimum 125 psig air. Test 100% of welds visually for leaks with each joint soaked in a foaming soapy water solution, and visually inspect each joint for leaks. Isolate and pressure test each run of piping for a minimum of one hour. Provide blind flanges, threaded caps or plugs at each end of the test section as needed. Do not conceal pipe joints before pressure testing is complete. Isolate equipment and components rated for lesser pressures so as not to damage these.

C. Pressure test piping system again after all equipment is installed at 50 psi for a minimum of one hour, or the maximum rated pressure of the weakest component, whichever is less.

D. Submit written procedures for testing, including test pressures, equipment to be used and items to be tested.

E. Notify the Authority in writing seven (7) days in advance of pressure tests. The Authority shall be present at all testing. Pressure testing performed without the Authority present will be rejected, unless prior written approval is received from the Authority.

F. Cut out, re-weld and re-test all leaking welded joints. Repair any leakage found and retest until system proves leak-free. Retesting after the repair of defects shall be performed at no cost to the Authority.

G. Certified test results shall be submitted to the Authority for approval. Test certification shall include gauge pressure, air temperature, time, date, witness, and pipeline identification.

3.6 SYSTEM STARTUP

A. Prime equipment and piping prior to testing and verify operation as indicated in 23 12 13.

END OF SECTION

SECTION 23 12 13

FUEL AND LUBE OIL EQUIPMENT AND SPECIALTIES

PART 1 – GENERAL

1.1 SUMMARY

A. Scope:

1. This section applies to all fuel (oil) piping systems.
2. See Drawings for delineation of work included in this contract.

B. Section Includes:

1. Fuel System Equipment.
2. Day Tank.
3. Hoses.

1.2 RELATED SECTIONS

A. Section 23 05 00 – Common Work Requirements for Mechanical.

B. Section 23 05 29 - Hangers and Supports for Piping and Equipment.

C. Section 23 11 13 - Fuel and Lube Oil Piping

1.3 SUBMITTALS

A. Provide submittals for all products and systems described herein. Provide in accordance with the requirements of Section 23 05 00 - Common Work Results for Mechanical and Division 1.

B. Product Data:

1. Submit manufacturers catalog literature including manufacturer's installation instructions for each item indicated on the Fuel System Equipment Schedule on Sheet M1.1.
2. Submit manufacturer’s catalog information hoses and all other items specified herein.

C. Shop Drawings: Submit shop drawings for day tank fabrication or provide confirmation indicate that fabrication will be in accordance with design.

1.4 CLOSEOUT

A. Division 1 - Closeout Requirements.

B. Operation and Maintenance Data: Submit instructions for calibrating instruments, installation instructions, assembly views, servicing requirements, lubrication instruction, and replacement parts list.

PART 2 – PRODUCTS

2.1 DIESEL FUEL SYSTEM EQUIPMENT

A. Provide pumps, meters, filters, equipment, and appurtenances as indicated in the Diesel Fuel System Equipment Schedule on Sheet M1.1.

2.2 DAY TANK

A. Day Tank: Rectangular heavy gauge welded steel tank manufactured in accordance with UL standard 142 and design drawings, capacity and configuration as indicated. Furnish complete with all controls and accessories as indicated.

2.3 HOSES

A. Fuel rated hose, Eaton Weatherhead H569 or approved equal. Sized as indicated on Drawings. Provide re-useable plated steel straight JIC swivel ends with NPT adapters.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Check equipment for damage that may have occurred during shipment. Repair damaged equipment as required or replace with new equipment.

3.2 PREPARATION

A. Protect bright finished shafts, bearing housings, and similar items until in service. No rust will be permitted.

3.3 INSTALLATION

A. Install pumps and associated equipment in accordance with applicable codes and per manufacturer's installation instructions.

B. Install fuel oil day tank as indicated on Drawings.

C. Electrical installation shall be in accordance with Division 26 Specifications.

3.4 SYSTEM STARTUP

A. Prior to starting fuel pumps, prime cavities with lube oil then energize momentarily to verify proper rotation.

B. Fuel Piping: Prime all piping, fill filters with diesel fuel, and bleed off air prior to starting pumps.

C. Verify operation of all day tank controls including timer and level alarms.

END OF SECTION

SECTION 23 21 13

HYDRONIC PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Scope:

1. This section applies to all hydronic (glycol) piping systems.
2. See Drawings for delineation of work included in this contract.

B. Section Includes:

1. Hydronic (coolant) piping.
2. Unions and flanges.
3. Valves.
4. Glycol coolant.

1.2 RELATED SECTIONS

A. Section 23 05 00 – Common Work Requirements for HVAC.

B. Section 23 05 29 - Hangers and Supports for Piping and Equipment.

C. Section 23 21 16 - Hydronic Specialties.

D. Section 26 32 13 – Engine Generators.

1.3 REFERENCES

A. American Society of Mechanical Engineers:

1. ASME B16.3 - Malleable Iron Threaded Fittings.
2. ASME B16.4 - Gray Iron Threaded Fittings.
3. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
4. ASME B31.1 - Power Piping.
5. ASME B31.9 - Building Services Piping.
6. ASME Section IX - Boiler and Pressure Vessel Code - Welding and Brazing Qualifications.

B. ASTM International:

1. ASTM A53B - Standard Specification for Pipe, Steel, Black and Hot-Dipped.
2. ASTM B88 - Standard Specification for Seamless Copper Water Tube.

C. American Welding Society:

1. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.

2. AWS D1.1 - Structural Welding Code - Steel.

D. Manufacturers Standardization Society of the Valve and Fittings Industry:

1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.

2. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.

1.4 SYSTEM DESCRIPTION

A. Where more than one piping system material is specified, provide compatible system components and joints.

B. Provide flanges, unions, and couplings at locations requiring servicing. Use unions, flanges, and couplings downstream of valves and at equipment connections. Do not use direct welded connections to valves or equipment.

C. Provide pipe hangers and supports in accordance with Drawings and specifications.

D. Use ball valves or butterfly valves for shut-off and to isolate equipment where indicated.

E. Use hose end drain valves with cap for drains where indicated.

F. Flexible Connectors: Use flexible connectors and hoses where indicated.

1.5 SUBMITTALS

A. Provide submittals for all products and systems described herein. Provide in accordance with the requirements of Section 23 05 00 - Common Work Results for Mechanical and Division 1.

B. Product Data:

1. Piping: Submit manufacturers catalog information for pipe materials, fittings, and accessories.

2. Valves: Submit manufacturer’s catalog information with valve data and ratings for each service.

C. Welders’ Certificate: Include welders’ certification of compliance in accordance with Quality Assurance below.

1.6 CLOSEOUT

A. Division 1 - Closeout Requirements

1.7 QUALITY ASSURANCE

A. Division 1 – Quality Control

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

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

D. Perform pipe welding with experienced welder with current API or equivalent certification for all pipe welding in all positions.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section.

B. Fabricator or Installer: Company specializing in performing Work of this section with current certification.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

1.10 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 COOLANT PIPING

A. Provide steel pipe mains and branch piping as indicated on Drawings.

1. Steel Pipe: ASTM A53B, welded black steel.
2. 1-1/2 inch diameter and larger: Schedule 40.
3. Smaller than 1-1/2 inch diameter: Schedule 80.
4. Provide butt weld joints and fittings for all piping 1-1/2 inches in diameter and larger except where specifically indicated as threaded. Provide socket weld or threaded joints for all piping smaller than 1-1/2 inches using minimum 3000 lb. forged steel fittings.

B. Provide copper tube and fittings only where specifically indicated on Drawings.

1. Copper Tubing: ASTM B88, Type L drawn.
2. Fittings: ASME B16.22 solder wrought copper.
3. Joints: soldered with 95-5 tin-antimony solder or silver solder except on tee drill connections use copper brazing rod.

2.2 UNIONS AND FLANGES

A. Unions:

1. Copper Piping: Bronze unions with solder ends except where specifically indicated as fitting unions provide solder by NPT bronze unions.
2. Steel Piping: ASTM A105 forged steel threaded unions, Class 3000 minimum.

B. Flanges:

1. Copper Piping: Class 150, bronze companion flanges for transition to steel piping or flanged valves and equipment.
2. Steel Piping: Class 150, flat face ASTM A235 seamless domestic carbon steel butt weld flanges for transition to copper piping or flanged valves and equipment.
3. Install full faced 1/8" thick nitrile rubber gaskets, Alaska Rubber or approved equal.

2.3 BUTTERFLY VALVES

A. Lug style ductile or cast iron body, ANSI 150# flange pattern ends, stainless steel stem with bronze bushing, bronze disc, EPDM seats, locking handle. Milwaukee ML-233E, Bray Series 31, or approved equal.

2.4 BALL VALVES

A. Threaded or soldered end as indicated and required, bronze body, chrome plated bronze or brass ball, full port, TFE or Viton packing and seat ring, minimum 200 psig WOG rating. Domestic only. Milwaukee, Hammond, Apollo, or approved equal.

2.5 CHECK VALVES

A. Threaded or soldered end as indicated and required, bronze body, swing check style, minimum 200 psig WOG rating. Domestic only. Milwaukee, Hammond, or approved equal.

2.6 DRAIN VALVES

A. Bronze body, 1/2" or 3/4" size and solder cup or MPT connection to match associated pipe, 3/4" male hose end with cap and jack chain. FNW 426D, 426F, 427D, or 427F or approved equal.

2.7 GAUGE COCK ISOLATION VALVE

A. Brass body, MPT by FPT ends, T-handle, Legend Valve item 101-531 (1/4") or Item 101-532 (3/8"), or approved equal.

B. Install on all pressure gauges, small hose connections, and where indicated on Drawings.

2.8 GLYCOL COOLANT

A. Glycol Solution: Furnish 110 gallons of pre-mixed glycol solution.

B. The glycol shall be extended life (heavy duty) ethylene glycol, Shell Rotella ELC, or approved equal. Note that standard life coolant will not be accepted.

C. The solution shall be premixed to a ratio of 50% ethylene glycol to 50% water. The water shall be treated in accordance with glycol manufacturer's recommendations. The mixed solution shall be dyed bright pink, no exceptions.

D. The solution shall be packaged in sealed 55 gallon drums and labeled "Ethylene Glycol" with pink lettering.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Check materials for damage that may have occurred during shipment. Repair damaged materials as required or replace with new materials.

3.2 PREPARATION

A. Ream threaded pipe ends. Remove burrs. Thoroughly coat male pipe ends with Teflon based pipe joint compound prior to assembling.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.3 INSTALLATION - PIPE HANGERS AND SUPPORTS

A. Install pipe hangers and supports in accordance with Section 23 05 29.

3.4 INSTALLATION - PIPING SYSTEMS

A. Install in accordance with manufacturer's instructions.

B. Route piping parallel to building structure and maintain gradient.

C. Install piping to conserve building space, and not interfere with use of space.

D. Group piping whenever practical at common elevations.

E. Install pipe identification in accordance with Section 23 05 00.

F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

G. Provide access where valves and fittings are not exposed.

H. Slope hydronic piping and arrange systems to drain at low points and vent at high points.

I. Prepare unfinished pipe, fittings, supports, and accessories, ready for finish painting. Refer to Section 23 05 00.

J. Install valves with stems upright or horizontal, not inverted.

K. Insulate piping as required by specifications; refer to Section 23 07 19.

3.5 TESTING

A. Hydrostatically test all piping at 100 psig minimum for one hour with no noticeable water leaks or pressure drops except as caused by temperature change.

B. Isolate engines and radiators prior to pressure testing.

3.6 FLUSHING

A. Fill the entire system with potable water and flush thoroughly. Run engines briefly with limited load as required to obtain circulation through the entire system. To ensure

engines are not damaged, do not run under high load or for extended periods of time with potable water.

B. Drain system completely.

3.7 FILLING AND CHARGING

A. After pressure testing and flushing, fill entire system with ethylene glycol solution. Perform all functional testing of the module required by the Contract Documents. Ensure that engines are operated long enough with adequate load to get thermostats fully open and to circulate glycol through all piping and accessories. Operate control room heating system to ensure it is fully charged with glycol.

3.8 DRAINING AND BREAKDOWN

A. Upon completion of testing allow system to cool down to ambient temperature. Isolate piping system with valves as required to allow portions of piping to be removed for module breakdown and shipping. Drain all external portions of the piping and place the glycol solution in the original drums. Place the drums in the module and secure for shipping.

END OF SECTION

SECTION 23 21 16

HYDRONIC EQUIPMENT AND SPECIALTIES

PART 1 – GENERAL

1.1 SUMMARY

A. Scope:

1. This section applies to all hydronic (glycol) piping systems.
2. See Drawings for delineation of work included in this contract.

B. Section Includes:

1. Coolant System Equipment.
2. Heating System Equipment.
3. Sight gauge.
4. Hoses.

1.2 RELATED SECTIONS

A. Section 23 05 00 – Common Work Requirements for HVAC.

B. Section 23 05 29 - Hangers and Supports for Piping and Equipment.

C. Section 23 21 13 - Hydronic Piping.

1.3 SUBMITTALS

A. Provide submittals for all products and systems described herein. Provide in accordance with the requirements of Section 23 05 00 - Common Work Results for Mechanical and Division 1.

B. Product Data:

1. Submit manufacturers catalog literature including manufacturer's installation instructions for each item indicated on the Coolant System Equipment Schedule and the Heating Equipment Schedule on Sheet M1.1.
2. Submit manufacturer’s catalog information for hoses and all other items specified herein.

C. Shop Drawings: Submit shop drawings for expansion tank fabrication or provide confirmation indicate that fabrication will be in accordance with design.

1.4 CLOSEOUT

A. Division 1 - Closeout Requirements.

B. Operation and Maintenance Data: Submit instructions for calibrating instruments, installation instructions, assembly views, servicing requirements, lubrication instruction, and replacement parts list.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section.

B. Installer: Company specializing in performing Work of this section.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Accept material on site in shipping containers with labeling in place. Inspect for damage.

B. Protect systems from entry of foreign materials by temporary covers, caps and closures, completing sections of the work, and isolating parts of completed system until installation.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Division 1 – Material and Equipment: Storage and Protection.

1.8 FIELD MEASUREMENTS

A. Verify field measurements before fabrication.

PART 2 - PRODUCTS

2.1 COOLANT SYSTEM EQUIPMENT

A. Provide all equipment and appurtenances as indicated in the Coolant System Equipment Schedule on Sheet M1.1 except for radiators as indicated on the drawings.

2.2 HEATING SYSTEM EQUIPMENT

A. Provide all equipment and appurtenances as indicated in the Heating System Equipment Schedule on Sheet M1.1.

2.3 LIQUID LEVEL SIGHT GAUGE

A. Borosilicate glass tube, aluminum body, Buna n seals, 1/2" MPT connections, 9” centers. Lube Devices G607-09-A-1-4 or approved equal.

2.4 EXPANSION TANK CAP

A. Pre-Vent Fill Cap, 2-1/2 PSIG Pressure, 1-1/2 Oz. Vacuum, 2" NPT Connection. Cim-Tek 60001 or approved equal

2.5 HOSES

A. Wire reinforced corrugated silicone hose. Parker 6621 or approved equal. Sized as indicated on the Drawings.

B. Install on barbed hose (king) nipples with stainless steel T-Bolt clamps, Nyco Supra W2, or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Check equipment for damage that may have occurred during shipment. Repair damaged equipment as required or replace with new equipment.

3.2 INSTALLATION

A. Install equipment and accessories in strict compliance with manufacturer's instructions.

B. Install piping system and appurtenances as indicated on Drawings.

3.3 CLEANING

A. Clean and flush glycol system before adding glycol solution. See Section 23 21 13 - Hydronic Piping.

END OF SECTION

SECTION 23 31 13

METAL DUCTS AND VENTILATION EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Duct Materials.
2. Fans.
3. Dampers.
4. Actuators.

1.2 RELATED SECTIONS

A. Section 23 05 00 – Common Work Requirements for Mechanical.

B. Section 23 05 29 - Hangers and Supports for Piping and Equipment.

C. Section 23 09 00 - Instrumentation and Control Devices.

1.3 REFERENCES

A. ASTM International:

1. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

B. Air Movement and Control Association International, Inc.: AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.

C. National Fire Protection Association: NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.

D. Sheet Metal and Air Conditioning Contractors: SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

1.4 PERFORMANCE REQUIREMENTS

A. Variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is not permitted except by written permission.

1.5 SUBMITTALS

A. Provide submittals for all products and systems described herein. Provide in accordance with the requirements of Section 23 05 00 - Common Work Results for Mechanical and Division 1.

B. Product Data:

1. Submit data for duct materials and accessories.
2. Submit manufacturers catalog literature for each item indicated on the Ventilation Equipment Schedule on Sheet M1.1.
3. Submit manufacturers catalog literature for dampers and actuators.

C. Shop Drawings: Submit shop drawings for review prior to fabrication of ductwork. Note that if ductwork will be fabricated exactly as indicated on the design drawings the design drawings can be submitted in lieu of shop drawings.

1.6 CLOSEOUT

A. Division 1 - Closeout Requirements.

B. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.7 QUALITY ASSURANCE

A. Division 1 – Quality Control

B. Perform Work in accordance with SMACNA - HVAC Duct Construction Standards - Metal and flexible and International Mechanical Code.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section.

B. Installer: Company specializing in performing work of this section.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Do not install duct sealant when temperatures are less than those recommended by sealant manufacturers.

B. Maintain temperatures during and after installation of duct sealant.

1.10 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Galvanized Steel: ASTM A653/A653M galvanized steel sheet, lock-forming quality, having zinc coating in conformance with ASTM A90.

B. Aluminum: Type 5052 alloy, minimum 0.090” thick.

C. Fasteners: Rivets, bolts, or sheet metal screws except where indicated as welded.

D. Sealants, Mastics and Tapes: Conform to UL 181A. Provide products bearing appropriate UL 181A markings.

2.2 FABRICATION

A. Fabricate and support rectangular ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and as indicated on Drawings. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

B. Fabricate assemblies from galvanized steel or aluminum as indicated on the drawings. Galvanized sheet metal assemblies shall have standard mechanical joints sealed airtight. Aluminum assemblies shall have continuous welded joints. Grind weld joints smooth after fabrication.

C. Exterior Hood Fabrications: fabricate all exterior hoods from minimum 0.090" thick Type 5052 aluminum using welded joints.

2.3 CONTROL DAMPER

A. Opposed blade low-leakage control damper, galvanized steel constructions, 304 stainless steel bearings and jamb seals, EPDM blades seals, Greenheck VCD-23 or approved equal. See fabrication details on Drawings for sizes.

2.4 ACTUATORS

A. On duct dampers install 120V spring return actuator, Belimo AFBUP or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Check equipment for damage that may have occurred during shipment. Repair damaged equipment as required or replace with new equipment.

B. Verify sizes of equipment connections before fabricating transitions.

3.2 INSTALLATION

A. Fabricate and install ducts as indicated on Drawings and in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.

B. Verify proper operation of fans and dampers.

END OF SECTION

SECTION 23 35 16.10

ENGINE EXHAUST AND CRANK VENT PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Engine Exhaust piping
2. Crank Vent piping
3. Mufflers
4. Flanges and Gaskets
5. Crank Vent Hose

1.2 RELATED SECTIONS

A. Section 23 05 00 – Common Work Requirements for Mechanical.

B. Section 23 05 29 - Hangers and Supports for Piping and Equipment.

C. Section 23 07 19 - Piping Insulation.

D. Section 26 32 13 – Engine Generators.

1.3 REFERENCES

A. American Society of Mechanical Engineers:

1. ASME B31.1 - Power Piping.
2. ASME B31.9 - Building Services Piping.
3. ASME Section IX - Boiler and Pressure Vessel Code - Welding and Brazing Qualifications.

B. ASTM International:

1. ASTM A53B - Standard Specification for Pipe, Steel, Black and Hot-Dipped.

C. Underwriters Laboratories Inc.:

1. UL 536 - Flexible Metallic Hose.

1.4 SYSTEM DESCRIPTION

A. Provide piping of material as specified in PART 2.

B. Where more than one piping system material is specified, provide compatible system components and joints. Use non-conducting dielectric connections when joining dissimilar metals in systems.

C. Provide flanges or couplings at locations requiring servicing and where indicated. Do not use direct welded connections to equipment.

D. Provide pipe hangers and supports per Drawings and specifications.

E. Flexible Connector: Use at exhaust piping connections to engine as indicated in Drawings.

1.5 SUBMITTALS

A. Provide submittals for all products and systems described herein. Provide in accordance with the requirements of Section 23 05 00 - Common Work Results for Mechanical and Division 1.

B. Product Data:

1. Piping: Submit manufacturers catalog information for pipe materials, fittings, and accessories.

2. Flanges and Gaskets: Submit manufacturer's catalog information with data and ratings for each service.

3. Mufflers: Submit manufacturer's catalog information.

4. Crank Vent Hose: Submit manufacturer's catalog information.

1.6 CLOSEOUT SUBMITTALS

A. Division 1 - Closeout Requirements.

1.7 QUALITY ASSURANCE

A. Division 1 – Quality Control

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

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

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section.

B. Fabricator or Installer: Company specializing in performing Work of this section.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Division 1 - Material and Equipment: Transportation and Handling.

B. Accept piping and materials on site in shipping containers with labeling in place. Inspect for damage.

C. Protect piping and fittings from soil and debris with temporary end caps and closures. Maintain in place until installation.

1.10 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 PIPING (EXHAUST, CRANK VENT, CHARGE AIR)

A. Exhaust Pipe: ASTM A-53 black steel pipe, Schedule 40.

B. Crank Vent Pipe: ASTM A-106B black steel pipe, Schedule 40.

C. Provide butt weld joints and fittings. Use long radius elbows, diameters to match piping.

D. Perform pipe welding with experienced welder with current API or equivalent certification for pipe welding in all positions.

2.2 FLEXIBLE CONNECTORS

A. Exhaust Pipe Flexible Connectors: Furnished with Engine Generator, see Section 26 32 13 – Engine Generators.

2.3 FLANGES

A. Exhaust flanges, slip-on ANSI 150# flat faced.

B. Gaskets, high temperature, full face, Frenzelit Novatec 925F or approved equal.

2.4 MUFFLERS

A. Mufflers to be disc style, bottom center in and side out, ASA 125# flanges, internal acoustical/thermal wrap, four mounting tabs, high temperature satin black finish. Mufflers shall be critical grade with minimum 28db reduction at 125Hz. E.M. Products DCK2, G.T. Exhaust Systems H1-5, or approved equal. See design drawings for size.

2.5 RAIN CAP

A. Exhaust rain caps, hinged type, all stainless steel construction, G.T. Exhaust Systems or approved equal. See design drawings for size

2.6 CRANK VENT HOSE

A. Crank Vent Hose: Heavy duty oil resistant PVC suction hose. Tigerflex ORV or approved equal. See design drawings for size.

B. Install on barbed hose (king) nipples with stainless steel T-Bolt Clamps Fasten with lined stainless steel T-bolt clamps, Nyco Supra W2, or approved equal

PART 3 - EXECUTION

3.1 EXAMINATION

A. Check materials for damage that may have occurred during shipment. Repair damaged materials as required or replace with new materials.

3.2 PREPARATION

A. Remove scale and dirt, on inside and outside, before assembly.

3.3 INSTALLATION - PIPE HANGERS AND SUPPORTS

A. Install pipe hangers and supports in accordance with Drawings and specifications. Refer to Section 23 05 29.

3.4 INSTALLATION - PIPING

A. Route piping in orderly manner and maintain gradient.

B. Install piping to conserve building space and not interfere with use of space.

C. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

D. Prepare pipe, fittings, supports, and accessories not pre-finished, ready for finish painting. Refer to Section 23 05 00.

E. Install identification on piping systems. Refer to Section 23 05 00.

F. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

G. Piping Insulation: Insulate interior exhaust piping as indicated on the Drawings.

3.5 INSTALLATION – MUFFLER

A. Install muffler in accordance with manufacturer’s installation instructions and as indicated on the Drawings.

END OF SECTION

SECTION 26 05 00

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. Provide the labor, materials, equipment and test equipment necessary to furnish, install, and place into operation the power, motor, lighting, control, alarm, and associated electrical systems of this Contract. Connect motors, meters, panels, sensors, switches, and outlets or any other electrical device installed or provided as part of the project. Mark and identify circuits, terminal boards, equipment, enclosures, etc. with identification numbers, wire numbers, nameplates, and warning signs. Test, adjust and calibrate equipment and start-up all electrical equipment and its associated mechanical attachments as necessary to place the project into operation.

B. Provide and install all control equipment and wiring to instruments and devices installed by others.

C. Where the work of several crafts is involved, coordinate all related work to provide each system in complete and in proper operating order.

D. Cooperate with all others involved in the project, with due regard to their work, to promote rapid completion.

E. Local Conditions: The Contractor shall thoroughly familiarize himself with the work as well as the local conditions under which the work is to be performed. Schedule work with regard to seasons, weather, climate conditions, and all other local conditions which may affect the progress and quality of work.

F. See Division 1 of which contain information and requirements that apply to work specified herein.

G. The Contractor shall provide electrical service to, connection and/or interconnection of various units of equipment supplied by others. The Contractor shall not be required to set in place or align motors or calibrate devices supplied as an integral part of equipment provided by others.

1.02 RELATED REQUIREMENTS

A. This section applies to all Division 26 work.

B. See Divisions 1, 23, 26, and 33 which contain information and requirements that apply to work specified herein.

1.03 TELEPHONE SERVICE

A. Telephone service is not a part of this project.

1.04 CODES AND STANDARDS

A. Codes: Perform all work in strict accordance with all applicable national, state, and local codes; including, but not limited to the latest legally enacted editions of the following specifically noted requirements:

1. NFPA 70, National Electric Code - NEC;
2. ANSI-C2, National Electrical Safety Code - NESC;
3. International Building Code - IBC; and
4. International Fire Code - IFC.

B. Standards: Reference to the following standards infers that installation, equipment, and materials shall be within the limits for which it was designed, tested, and approved, in conformance with the current publications and standards of the following organizations:

1. American National Standards Institute - ANSI;
2. American Society for Testing and Materials - ASTM;
3. American Society of Heating, Refrigerating and Air Conditioning Consultants - ASHRAE (Standard 90-75);
4. Factory Mutual – FM;
5. Institute of Electrical and Electronics Consultants - IEEE;
6. National Electrical Contractors Association - NECA;
7. National Electrical Manufacturers' Association - NEMA;
8. National Fire Protection Association - NFPA, and
9. Underwriters Laboratory - UL

1.05 SPECIFIC TERMINOLOGY

A. Streamlining: In many instances, the products, reference standards, and other itemized specifications have been listed without verbiage. In these cases, it is implied that the Contractor shall provide the products and perform in accordance with the references listed.

B. The word "Contractor" as used in Division 26 specifications shall mean "Electrical Contractor."

C. The word "General Contractor" as used in Division 26 specifications shall mean the Contractor responsible for the project.

D. "Furnish" means to purchase material as shown and specified, and cart the material to an approved location at the site or elsewhere as noted or agreed to be installed by supporting crafts.

E. "Install" means to set in place and connect, ready for use and in complete and properly operating finished condition, material that has been furnished.

F. "Provide" means furnish all products, labor, sub-contracts, and appurtenances required and install to a complete and properly operating, finished condition.

G. "Rough-in and Connect" means provide an appropriate system connection such as conduit with "J" boxes, wiring, switches, disconnects, etc., and all wiring connections. Equipment furnished is received, uncrated, assembled and set in place under the Division in which it is specified.

H. "Accessible" means arranged so that an appropriately dressed man 6-foot 2 inches tall, weighing 250 pounds, may approach the area in question with the tools and products necessary for the work intended, and may then position himself to properly perform the task to be accomplished, without disassembly or damage to the surrounding installation.

I. "Serviceable" means arranged so that the component or product in question may be properly removed and replaced without disassembly, destruction, or damage to the surrounding installation.

J. "Product" is a generic term which includes materials, equipment, fixtures, and any physical item used on the project.

1.06 DRAWINGS, SPECIFICATIONS & SYMBOLS

A. The Plans and Specifications are complementary; what is shown on one is as binding as if called for in both. Do not scale the Plans. Locations of devices, fixtures, and equipment are approximate unless dimensioned.

B. The Plans are partly diagrammatic and do not show precise routing of conduits or exact location of all products, and may not show in minute detail all features of the installation; however, provide all systems complete and in proper operating order.

C. Drawing symbols used for basic materials, equipment and methods are commonly used by the industry and should be universally understood. Special items are identified by a supplementary list of graphical illustrations, or called for on the Plans or in the specifications.

1.07 SUBMITTALS, MANUALS AND SHOP DRAWINGS

A. Submittals: Provide submittals for all products and systems described in Division 26 specifications and shown on the Plans to demonstrate compliance with the requirements of the project. Furnish submittals in the manner described herein, and in Division 1. In addition, include data for review, and organize data, as noted below: In addition, include data for review, and organize data, as noted below:

1. Specific reference and/or drawings reference for which literature is submitted for review with an index, following specification format, and item by item identification.

2. Manufacturer's name and address, and supplier's name, address, and phone number.

3. Catalog designation or model number with rough-in data and dimensions.

4. Operation characteristics.

5. Complete customized listing of characteristics required. Indicate whether item is "As Specified" or "Proposed Substitution." Indicate any deviations on submittal. Mark out all non- applicable items. The terminology "As Specified" used without this customized listing is not acceptable.

6. Wiring diagrams for the specific system.

7. Coordination data to check protective devices.

8. Working construction Drawings (Shop Drawings).

B. Submittal Data:

a. Individual Special Systems (Control Panels, etc.)

b. Transformers.

c. Potential and current transformers.

d. Electrical Utilities material and equipment.

e. Lighting Fixtures, Lamps and Accessories

f. Service, Disconnects.

g. Raceways, Fittings, and Supports.

h. Conductors.

i. Wire and Cable.

j. Wiring Devices.

k. Additional items that may be listed on the Schedules, Bill of Materials or specified on the drawings.

9. Submittal review is for general design and arrangement only and does not relieve the Contractor from any of the requirements of the Contract Documents. Submittals will not be checked for quantity, dimension, fit or proper technical design of manufactured equipment. Where deviations of substitute product or system performance have not been specifically noted in the submittal by the Contractor, provision of a complete and satisfactory working installation of equal quality to system specified is the sole responsibility of the Contractor.

1.08 TESTS

A. Division 1 - Closeout Requirements.

B. The Contractor shall be responsible for field testing all station service and other electrical systems and equipment shown on the drawings. Testing of the generators and switchgear will be performed by the AUTHORITY after substantial completion.

C. The Contractor shall prepare and submit a test plan for review and approval by the AUTHORITY.

1. Field testing cannot take place without an approved test plan.

a. The Test Plan shall outline the tests planned for each item of equipment.

b. The Test Procedures shall identify the test equipment to be utilized, the action of each test step and the expected result so that a test technician who has no knowledge of the details of the equipment design shall be able to successfully conduct the test.

2. In the presence of the AUTHORITY,

a. Test the equipment and electrical circuits for proper connection, continuity, and absence of undesirable shorts and grounds.

b. Test wire and cable installation, when complete.

c. Check for continuity, visual damage, marking, and proper phase sequence before performing insulation testing.

1) Megger bus work, switches, breakers and circuits phase-to-phase and phase-to-ground disconnecting and reconnecting equipment which cannot be meggered otherwise.

2) The minimum acceptable steady-state value is 50 megohms. Ambient temperature and humidity during testing shall be recorded.

3. Verify operation, calibration, and settings of the meters, relays and indicating devices.

4. Check all auxiliary equipment, i.e., heaters, thermostats, lights, and all illuminated indicating devices and lamps, and all audible alarm devices to verify that they function properly.

5. Take station service equipment test load readings after all loads are connected. Obtain the maximum reading for each phase and neutral with all lighting, appliances, motors (as applicable use largest combination), and other loads connected to the panels in service.

6. Check fuses with an ohmmeter; ring out wiring and busing; check operation of control and safety interlocks.

7. Test motor driven equipment motors before energization. Insulation test shall consist of megohmeter check phase-to-ground, per IEEE Standard 43 or manufacturer's recommendations.

8. Load test each motor of motor driven equipment showing the following:

   a. Nameplate ratings (horsepower), (speed), (voltage), (phase), (ampere rating of motor at full load).

   b. Measured load in amperes on lines 1-2.

9. Load test pump motors, noting the operating conditions at the time of the test. Motor test data shall show suction and discharge conditions (pressure, temperature, humidity, to where such conditions affect load).

10. Overload heaters shall be checked and the size on each phase shall be noted at this time on the test sheet.

D. Report all test results in writing. Where tests disclose problem areas, retest after the defect has been corrected.

E. Demonstrate that the electrical installation is working by operating all electrical systems and equipment. Simulate control inputs, responses to outputs and alarm conditions and their acknowledgement, artificially where necessary, for complete system tests.

F. Operate the electrical systems until acceptance of the work. Instruct operators in the correct operation of all electrical and control systems under your jurisdiction.

G. Any rework or repair of equipment required during or as a result of the testing shall be done by the Contractor at no additional expense to the AUTHORITY.

H. The Contractor shall furnish to the AUTHORITY at the time the project is accepted, any special tools, calibration equipment, and testing apparatus specified or furnished by the equipment manufacturer for the proper adjustment and maintenance of the electrical equipment provided.

1.09 CODES AND INSPECTIONS

A. Electrical work shall be installed in accordance with the latest edition of the National Electric Code and local and state codes in legal force in the project area.

1. If the Contractor observes that the Plans and/or Specifications are at variance with such codes and regulations, he shall promptly notify the AUTHORITY in writing.

2. Should the Contractor perform any work in non-compliance with the above-mentioned codes and regulations without such notice to the AUTHORITY, the Contractor shall bear all costs arising therefrom.

B. The above codes are referenced to establish minimum requirements and wherever this specification requires higher grades of material or workmanship than required by the codes, this specification shall prevail.

C. All electrical work shall be performed by Alaska licensed Journeyman Electricians or licensed Apprentice Electricians under the direct supervision of a licensed Electrical Administrator.

D. Submit written proof of all Journeyman and Apprentice Electricians' current licenses.

E. Submit certification for tests and inspections required by the electrical inspector having jurisdiction. Certificates of approval that are issued shall be transmitted to the AUTHORITY.

F. The Contractor shall pay all costs and fees required by inspecting and other agencies required for his work.

G. Cooperate with the AUTHORITY and provide assistance at all times for the inspection of the electrical work performed under this Contract. Remove covers, operate machinery, or perform any reasonable work which, in the opinion of the AUTHORITY, will be necessary to determine the completeness, quality, or adequacy of the work.

1.10 COORDINATION

A. Electrical Plans are partly diagrammatic and it is not the intent to show in detail all features of work or exact physical arrangement of equipment. The location of outlets and equipment are approximate unless dimensioned. The exact locations and routing of conduits shall be governed by structural conditions and physical

interferences and by the location of electrical terminations on equipment. Equipment shall be located and installed so that it will be readily accessible for operation and maintenance.

B. If conduit is placed incorrectly with respect to equipment connections or if equipment connections are relocated without appropriate changes in the electrical work, and the resulting work is not coordinated, the work affected shall be removed and re-installed at the Contractor's expense, even if removal and replacement of structural and/or mechanical parts of the work are necessary.

C. The Contractor shall schedule his work to coordinate through the General Contractor and with all other subcontractors, power and telephone utilities in order to maintain job progress and to avoid conflicts with equipment installation or work done by the various trades.

D. The Contractor is responsible for maintaining required clearspace. Should the Contractor become aware of a clearspace violation or if the installation of electrical equipment as shown produces a clear pace violation, notify the AUTHORITY in writing before proceeding with the installation.

1.11 LOCATIONS.

A. If hazardous location boundaries exist, they will be shown on the drawings. Locations for seal-off fittings shall be field determined by the Contractor.

B. Wet Locations: Wet locations shall include all areas underground (below grade), in direct contact with the earth, areas subject to saturation with water or other liquids from splashing, surface water, exposed to the weather and unprotected.

1.12 RECORD DRAWINGS

A. Division 1 – Project Record Documents.

B. Reference requirements stated elsewhere in these specifications.

C. In addition to other requirements, mark up a clean set of Plans as the work progresses, to show the dimensioned location and routing of all electrical work which will become permanently concealed. Show routing or work in permanently concealed blind spaces within the facility. Show complete routing and sizing of any significant revisions to the systems shown.

D. Maintain Record drawings in an up-to-date fashion in conjunction with the actual progress of installation. "Record" progress mark-ups shall be available on-site for examination by the AUTHORITY at all times.

E. Prepare wiring diagrams on reproducible media using AutoCAD V.2012 or later for all individual special systems as installed. Identify all components and show all wire and terminal numbers and connections.

F. Prior to substantial completion, deliver these drawings and their electronic files in both .dwg and full size .pdf format to the AUTHORITY and obtain a written receipt.

1.13 OPERATING INSTRUCTIONS

Prior to final acceptance, instruct operators on the proper operation and maintenance of all electrical systems and equipment under this contract. Make available a qualified technician for each component of the installation for this instruction. Give these operating instructions after the operation and maintenance manuals have been furnished to the AUTHORITY.

1.14 OPERATION AND MAINTENANCE MANUALS

A. Provide Operation and Maintenance Manuals in the manner described elsewhere in these specifications. In addition, organize manual and include data and narrative as noted below. Submit in accordance with Division 1.

B. Provide a separate chapter for each section of the electrical specifications with subchapters for each class of equipment or system. Provide a table of contents for each chapter, and each major item in each chapter, to indicate the page number of each. Label all pages to assure correct placement in manual. Identify each piece of equipment with its associated nameplate number, i.e. pump P-1A, etc.

C. Operating Sequence Narrative:

1. In each chapter, describe the procedures necessary for personnel to operate the system and equipment covered in that chapter.

2. Describe procedures for start-up, operation, emergency operation and shutdown of each system. If a particular sequence is required, give step- by-step instructions in that order.

3. Describe all seasonal adjustments which should be accomplished for each system.

4. Provide the above descriptions in typewritten, simple outline, narrative form.

D. Maintenance Instructions:

1. Provide complete information for preventive maintenance for each product, including recommended frequency of performance for each preventive maintenance task.

2. Provide all information of a maintenance nature covering warranty items, etc., which have not been discussed in the manufacturer's literature or the operating sequence narrative.

3. Provide complete informational data for all the spare and replacement parts for each product and system. Properly identify each component by part number and manufacturer.

E. Manufacturers' Brochures: Include manufacturers' descriptive literature covering all products used in each system, together with illustrations, exploded views and renewal parts lists. Highlight all applicable items and instructions, or mark-out non-applicable items. Brochure bearing submittal review stamp are not acceptable.

F. Shop Drawings: Provide a copy of all corrected, approved shop drawings for the project either with the manufacturers' brochures or properly identified in a separate subsection.

1.15 INSTRUCTION OF OPERATING PERSONNEL

A. Provide services of qualified representative of supplier of each item or system listed below to instruct operators in operation and maintenance of item or system.

B. Make instruction when system is complete of number of hours indicated, and performed at time mutually agreeable.

1. Electrical Distribution Equipment: 2 hours

2. Alarm and Control Panels: 2 hours per panel

C. Have approved operating and maintenance data, and parts lists for all equipment on hand at the time of instruction.

1.16 PROJECT COMPLETION AND DEMONSTRATION

A. Division 1 - Closeout Requirements.

B. Tests: During final inspection, conduct operating tests for approval.

C. Demonstrate installation to operate satisfactorily in accordance with requirements of Contract Documents. Should a portion of installation fail to meet requirements of Contract Documents, repair or replace items failing to meet requirements until items can be demonstrated to comply.

D. Have instruments available for measuring, voltage and current values and for demonstration of continuity, ground, or open circuit conditions. Furnish personnel to assist in taking measurements and making tests.

E. In the event that systems are not complete and fully operational at the time of Final Inspection, all costs of any subsequent inspections shall be borne by the Contractor at no additional cost to the AUTHORITY.

1.18 CERTIFICATE OF COMPLETION

A. Submit, at time of request for Final Inspection, a completed letter in the following format:

I,_____(Name), of _____(Firm), certify that the Electrical Work is complete in accordance with Contract Plans and Specifications, and authorized change orders (copies of which are attached hereto), and will be ready for Final Inspection as of _____(Date). I further certify that the following Specification requirements have been fulfilled:

1. Megger readings performed, ____ copies of log attached.
2. Operating manuals completed and instructions of operating personnel performed_____(Date).

   _____(Signed)
   Alaska Energy Authority
3. Record drawings up-to-date and ready to deliver to the AUTHORITY.
4. Emergency systems tested and fully operational.
5. All other tests required by Specifications have been performed.
6. All systems are fully operational. Project is ready for Final Inspection.

SIGNED:_____ DATE:_____

TITLE:_____

PART 2 – MATERIALS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 26 05 02

BASIC MATERIALS AND METHODS

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. This Section describes specific requirements, products, and methods of execution which are typical throughout the Electrical Work of this Project. Additional requirements for the specific systems will be found in the Division specifying those systems.

1.02 RELATED REQUIREMENTS

A. Section 26 05 00 Common Work Results for Electrical

B. All other Divisions 1, 23, 26, and 33 Specifications

1.03 COORDINATION

A. Layout all the work in advance and avoid conflict with other Work in progress. Physical dimensions shall be determined from Civil and Structural plans. Verify locations for junction boxes, disconnect switches, stub-ups, etc., for connection to equipment furnished by others, or in other Divisions of this Work.

1.04 SERVICEABILITY OF PRODUCTS

A. Furnish all products to provide the proper orientation of serviceable components to access space provided.

B. Coordinate installation of all products to allow proper service areas for any items requiring periodic maintenance inspection or replacement.

C. Replace or relocate all products incorrectly ordered or installed.

1.05 ACCESSIBILITY OF PRODUCTS

A. Arrange all work to provide access to all serviceable and/or operable products. Layout work to optimize net usable access space within confines of space available. Advise the Authority, in a timely manner, of areas where proper access or required clearspace cannot be maintained. Furnish Layout Drawings to verify this claim, if requested.

B. Provide access doors in ceilings, walls, floors, etc., for access to j-boxes, automatic devices, and all serviceable or operable equipment in concealed spaces.

PART 2 – PRODUCTS

2.01 PRODUCTS FURNISHED IN DIVISION 26

A. All products furnished and installed in permanent construction shall be new, full-weight, standard in every way, and in first class condition.

B. All equipment furnished by the Contractor shall be listed by and shall bear the label of Underwriters' Laboratories, Incorporated, (UL) or of an independent testing laboratory acceptable to the local Code- enforcement agency having jurisdiction.

C. Products shall be identical with apparatus or equipment which has been in successful operation for at least two years. All products of similar class or service shall be of one manufacturer.

D. Capacities, sizes, and dimensions given are minimum unless otherwise indicated. All systems and products proposed for use on this project shall be subject to review for adequacy and compliance with Contract Documents.

2.02 PRODUCTS FURNISHED IN OTHER DIVISIONS

A. Controls, including conduit, wiring, and control devices required for the operation of systems furnished in other Divisions shall be installed in accordance with Division 26 Specifications.

B. All equipment furnished by the Contractor shall be listed by and shall bear the label of Underwriters' Laboratories, Incorporated (UL) or of an independent testing laboratory acceptable to the local Code-enforcement agency having jurisdiction.

C. All work on the project that falls under the jurisdiction of the electrical trade shall be performed by Licensed Electricians in possession of Alaska State Fitness Cards in conformance with the Electrical Specifications.

D. Provide complete power connections to equipment including but not limited to feeders, connections, disconnects and motor running overcurrent protection. Where starters are provided as part of a packaged product, overcurrent heaters shall be provided.

2.03 IDENTIFICATION

A. Equipment Labels and Nameplates:

1. Provide rigid engraved labels and nameplates of laminated plastic 1/16-inch thick with white letters on a black or gray background. Label for emergency equipment shall be red with white letters.
   a. Securely attach labels with two screws, minimum, per label, unless rating of panel is affected, use epoxy.
   b. Temporary markings not permitted on equipment. Repaint trims housings, etc., where markings cannot be readily removed. Refinish defaced surfaces.
   c. No labeling abbreviations will be permitted without prior approval.
2. Label and Nameplate Locations:
   a. Provide 1/2-inch minimum height letters on following equipment:

1) Service disconnects (red background).

2) Secondary feeder breakers in distribution equipment. Designation as required by load served.

3) Special equipment housed in cabinets, as designated on plans, on outside of door.

b. Provide 1/4-inch minimum height letters on:

1) Disconnects and starters for motors or fixed appliances - (include item designation and branch feeder circuit number); and

2) Designated electrical equipment.

B. Branch Circuit Panelboard Schedules: Provide neatly typed schedule (odd numbered circuits on left side or top, even on right side or bottom) under plastic jacket or protective cover to protect the schedule from damage or dirt. Securely mount on inside face of panelboard door. Define briefly, but accurately, nature of connected load (i.e., Lighting, interior; receptacles, work bench; etc.) as approved.

C. Empty Conduits: Provide tags with typed description of purpose, and location of opposite end, wired to each end of conduits provided for future equipment.

D. Conduits: Mark all conduits entering or leaving panels with indelible black magic marker with the circuit numbers of the circuits contained inside.

E. Junction Boxes: Mark the circuit numbers of wiring on all junction boxes with steel covers. Mark with indelible black marker.

F. Conductors:

1. Conductors shall be color coded as indicated on the Electrical Conductor Schedule on Sheet E1.1.

2. Control and alarm circuit conductors

a. Field conductors shall be identified by destination panel and terminal block designations.

b. Internal (Control Panel) numbering system shall be provided by the Contractor. The numbering system shall assign each logical conductor set a unique identification number that will be reflected on the as-built drawings.

PART 3 – EXECUTION

3.01 STORAGE AND HANDLING

A. Division 1 – Material and Equipment.

B. All items shall be delivered and stored in original containers, which shall indicate manufacturer's name, the brand, and the identifying number.

C. Items subject to moisture and/or thermal damage shall be stored in a dry, heated place.

D. All items shall be covered and protected against dirt, water, chemical and/or mechanical damage.

3.02 PROTECTION OF PRODUCTS

A. The Contractor shall be held responsible for products to be installed under this Contract.

B. The Contractor will be required to make good, at his own cost, any injury or damage which said products may sustain before Final Acceptance.

3.03 INSTALLATION

A. All products shall be installed by skilled craftsmen. The norms for execution of the work shall be in conformity with NEC Chapter 3 and the NECA "Standards of Installation," which herewith is made part of these Specifications.

B. Provide working space in accordance with NEC 110.26 to permit ready and safe operation and maintenance of equipment.

C. Repair all surfaces and furnish all required products and labor to maintain fire-proof, air-tight and water- proof characteristics of the construction.

D. Installation of all equipment shall be in accordance with manufacturer's instructions.

3.04 SUPPORT SYSTEMS

A. All interior materials used shall be galvanized or zinc plated.

B. All exterior materials used shall be stainless steel. Where support elements are field cut, exposed metal shall be coated with spray-on galvanizing.

C. Support from structure only.

D. Conduits shown to be run at grade shall be supported by wood sleepers as shown on the drawings. Conduits may share fuel piping sleepers if installed such that neither system will require removal during maintenance or replacement.

3.05 MOUNTING HEIGHTS

A. Mounting heights shall be above finished floor (AFF) or above finished grade as noted below, unless otherwise shown or indicated.

1. Lighting Switches, 48 inches to center

2. Receptacles shall be mounted as indicated on the Drawings.

B. Other mounting heights are indicated on the Drawings by detail.

3.06 CUTTING AND PATCHING

A. Obtain written permission from the AUTHORITY before cutting or piercing structural members.

B. Sleeves through floors and walls to be galvanized iron pipe, flush with walls, ceilings or finished floors, sized to accommodate the raceway. Interstitial space around conduit passing through sleeves shall be filled with non-hardening duct sealant.

3.07 PROTECTIVE FINISHES

A. Take care not to scratch or deface factory finish on electrical apparatus and devices. Repaint all marred or scratched surfaces.

B. Provide hot dip galvanized components for ferrous materials exposed to the weather.

3.08 CLEAN-UP AND COMMISSIONING

A. Throughout the Work, the Contractor shall keep the work area reasonably neat and orderly by periodic clean-ups.

B. As independent parts of the installation are completed, they may be commissioned and utilized during construction.

3.09 WARRANTY

A. Division 1 - Closeout Requirements: Warranties.

B. Unless otherwise specified, the Warranty starts on the date Written Notice is given that the project is complete and all required corrections have been made. Warranty shall certify that all defects in products or workmanship shall be promptly repaired or replaced by the Contractor, to the satisfaction of the AUTHORITY, for a period of one year, except when, in the opinion of the AUTHORITY such failure is due to neglect or carelessness by the AUTHORITY.

3.10 OPERATIONAL INSTRUCTIONS

A. The Contractor shall instruct operators in the operation of the products shown and/or specified.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. This section describes general requirements, products, and methods of execution relating to the furnishing and installation of a grounding system complete as required for this project.

1.02 RELATED REQUIREMENTS

A. Section 26 05 00 Common Work Results for Electrical

B. Section 26 05 02 Basic Materials and Methods

1.03 MINIMUM REQUIREMENTS

A. The minimum requirement for the system shall conform to Article 250 of the NEC.

1.04 SUBMITTALS

A. Shop Drawings and Product Data: Submit shop drawings and product data for the products of this section in compliance with Section 26 05 00 Common Work Results for Electrical.

PART 2 – PRODUCTS

2.01 GROUND CONNECTIONS

A. All underground ground connections shall be made with exothermic welds.

B. Grounding conductor connections to building structure and generator skids shall be made with mechanical lugs as indicated.

PART 3 – EXECUTION

3.01 SERVICE AND STRUCTURE GROUND

A. Provide Service Ground.

B. Create a Grounding Electrode System (GES) for this project by connecting the following:

1. Grounding grid as shown on the Drawings.

2. Generators, switchgear, and transformers grounded as shown on the Drawings.

3. The neutral conductors grounded only where specifically indicated on the Drawings.

4. Other items or equipment as indicated on the Drawings.

5. Current carrying capacity of the grounding and bonding conductors shall be in conformity with Tables 250.66 and 250.122 of the NEC.

C. All structure bonding shall be in accordance with manufacturer's recommended practice.

3.02 EQUIPMENT GROUND

A. The raceway system shall be bonded in conformity with NEC requirements to provide a continuous ground path. Where required by code or where called for on the Plans, an additional grounding conductor shall be sized in conformity with Table 250.122 of the NEC.

B. Provide a separate copper equipment grounding conductor for each feeder and for each branch circuit indicated. Install the grounding conductor in the same raceway with the related phase and neutral conductors, and connect the grounding conductor to pull boxes or outlet boxes at intervals of 100 feet or less. Where paralleled conductors in separate raceways occur, provide a grounding conductor in each raceway. Connect all grounding conductors to bare grounding bars in panel boards, and to ground buses in service equipment to the end that there will be an uninterrupted grounding circuit from the point of a ground fault back to the point of connection of the equipment ground and system neutral. All grounding conductors shall be sized in conformity with Table 250.122 of the NEC.

C. Provide separate grounding conductor securely bonded and effectively grounded to both ends of all non-metallic raceways and all flexible conduit.

D. If non-metallic enclosures are provided, all metal conduits terminating or entering the enclosure shall be bonded together with approved bonding bushings and #6 AWG copper cable.

END OF SECTION

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. Support and align raceways, cabinets, boxes, fixtures, etc., in an approved manner and as specified.

1.02 RELATED REQUIREMENTS

A. Section 26 05 00 Common Work Results for Electrical

B. Section 26 05 02 Basic Materials and Methods

C. Section 26 05 33 Raceway and Boxes for Electrical Systems

1.03 SUBMITTALS

A. Shop Drawings and Product Data: Submit shop drawings and product data for the products of this section in compliance with Section 26 05 00 Common Work Results for Electrical.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Support raceways on approved types of wall brackets, ceiling trapeze hangers, or malleable iron straps.

1. Unistrut, B-Line, Grinnell, or equal.

2. Plumbers perforated strap not permitted as means of support.

3. Support used for exterior equipment shall be stainless steel.

B. Earthquake anchorages:

1. Anchor equipment weighing more than 100 pounds to the building structure to resist lateral earthquake forces.

2. Total lateral (earthquake) force shall be 1.00 times the equipment weight acting laterally in any direction through the equipment center of gravity. Provide adequate backing at structural attachment points to accept the forces involved.

3. Provide equipment supported by flexible isolation mounts with earthquake restraining supports positioned as close to equipment as possible without contact in normal operation (earthquake bumpers). The maximum lateral displacement due to the computed earthquake force from above shall not exceed 1.5 inches. Floor mounted equipment weighing less than 2000

pounds may have one 6-inch by 6-inch by 3/8-inch by 18-inch steel angle bolted to the floor with four 5/8-inch diameter bolts placed on each of four sides of the equipment.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Conduits and equipment shall be mounted using strut or similar supports unless otherwise noted.

B. Do not strap conduits to piping. When run in parallel with piping maintain adequate separation to allow maintenance to take place on either piping or conduit system so that the other does not have to be removed when maintenance is required.

END OF SECTION

SECTION 26 05 33

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. This section describes specific requirements, products, and methods of execution relating to conduit and conduit fittings approved for use on this project. Type, size and installation methods shall be as shown on the Plans, required by Code and specified in these specifications.

1.02 RELATED REQUIREMENTS

A. Section 26 05 00 Common Work Results for Electrical

B. Section 26 05 02 Basic Materials and Methods

C. Section 26 05 26 Grounding and Bonding for Electrical Systems

1.03 QUALITY ASSURANCE

A. Conduit and conduit fittings shall be standard types and sizes as manufactured by a nationally recognized manufacturer of this type of materials and be in conformity with applicable standards and UL listings.

1.04 SUBMITTALS

A. Shop Drawings and Product Data: Submit shop drawings and product data for the products of this section in compliance with Section 26 05 00 Common Work Results for Electrical.

PART 2 – PRODUCTS

2.01 GALVANIZED RIGID CONDUIT (GRC)

A. Galvanized rigid conduit shall be mild steel with continuous welded seam, hot-dip galvanized complying with ANSI C80.1 and shall be UL listed.

B. Elbows, bends, and fittings shall be made of full weight materials complying with the above and shall be coated and threaded the same as conduit.

C. Threads for conduit shall be tapered and clean cut. All threads shall be hot dip galvanized after cutting.

D. Conduit shall be 1/2-inch trade size or larger and shall be manufactured by Allied Tube and Conduit Corp., Triangle PWC, Inc., or approved equal.

2.02 ELECTRICAL METALLIC TUBING (EMT)

A. Steel tubing, galvanized outside and provided with a slick corrosion resistant interior coating; UL listed and labeled according to Standard 797; conforming to ANSI Standard C80.3.

2.03 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

A. Liquidtight flexible conduit shall be manufactured from galvanized steel strip, sealed with a polyvinyl outer jacket and shall be UL listed.

B. Fittings shall be designed for use with liquidtight flexible conduit and shall maintain electrical continuity throughout fittings and conduit.

C. Liquidtight flexible metal conduit shall be 1/2-inch trade size or larger and shall be manufactured by O-Z/Gedney Co., Southwire Co., or approved equal.

2.05 FITTINGS

A. Expansion fittings shall be O.Z. type AX, EX, EXDS, TX, or EXE; Crouse Hinds type XJ; or approved equal.

B. Fittings utilized with rigid steel shall be galvanized steel. Conduit bushings shall be of the insulated type. Where grounding bushings are required, insulated grounding bushings with pressure type lugs shall be provided. Lock rings shall be of the sealing gland type. Provide conduit bushings on all penetrations without hubs.

C. Couplings and Terminations for Electrical Metallic Tubing (EMT): Join lengths of EMT with steel compression type couplings and connectors. The connectors shall have insulated throats or a smooth interior so as not to damage the insulation during pulling operations.

D. Fittings for liquid-tight flexible conduit shall be steel or malleable iron, of a type incorporating a threaded grounding cone, nylon or plastic compression ring, and a tightening gland, providing a low resistance ground connection. All throats shall be insulated.

2.06 WIREWAY

A. Interior Use: UL listed; NEMA 1, enamel finished; hinged covers except where indicated otherwise. Furnish complete with all fittings, couplings, hangers and accessories; Hoffman, B-Line or equivalent.

PART 3 – EXECUTION

3.01 CONDUIT USAGE

A. All interior locations shall be electrical metallic tubing (EMT) except where specifically indicated as wireway or GRC.

B. Liquidtight flexible metal conduit shall be used in lengths 18 to 24 inches for connections to motors or equipment subject to vibration and where indicated on the Drawings. Longer lengths may be used for equipment connection if grounding conductor is installed through conduit.

3.02 CONDUIT INSTALLATION, GENERAL

A. Conduit field joints shall be cut square and reamed smooth. Threads shall be cleanly cut and joints drawn up tight. Running threads shall not be permitted.

B. After cutting and threading exterior GRC, threads shall be cleaned and degreased and shall receive two coats of cold galvanizing compound.

C. Offsets and bends shall be made carefully, without reducing cross sectional area, and shall not be less than the radius of standard elbows.

D. Convenience outlets, switches, and other devices located on walls shall be serviced from above, unless otherwise indicated.

E. Raceways penetrating vapor barriers or traversing from warm to cold areas shall be sealed (at the penetration point) with a non-hardening duct sealing compound to prevent the accumulation of moisture.

F. All metal conduits shall have insulating bushings and shall have locknuts inside and outside of enclosure box, etc. Conduits smaller than 1-1/4-inch trade size shall be equipped with bushings and shall have locknuts inside and outside of enclosure.

G. All conduit runs shall be grounded in an effective and approved manner at point of origin and shall maintain a continuous ground throughout all runs, cabinets, pull boxes, and fittings from point of service to all outlets.

H. Conduit Supports:

1. Support conduits by wall brackets, pipe straps and strut sections, or trapeze hangers spaced not more than 10 feet on center.

2. Conduits shall be supported from the structural system. Provide additional support as required for junction and pull boxes.

J. All conduit runs shall be completed and cleaned free from foreign matter inside before conductors are drawn in. After installation conduit ends shall be plugged or capped to prevent the entrance of foreign materials.

K. All conduits not used by this Contract shall have a pull wire installed and securely tied off at each end for future conductor installation.

END OF SECTION

SECTION 26 23 00.10

PRIME POWER LOW-VOLTAGE SWITCHGEAR

PART 1 - GENERAL

1.1 SCOPE

A. The Work included herein shall consist of providing design, drawings, materials, and accessories as specified herein for paralleling switchgear to be used to parallel two diesel generating units for prime power generation. The Work included herein shall consist of, but not be limited to, designing, fabricating, providing, and factory testing complete switchgear as specified herein.

B. Project design drawings shall be used in the design of the switchgear.

C. The specifications and drawings are complementary. What is shown on one is binding whether or not it is shown or specified in the other. Failure to check both the drawings and specifications will not be grounds for a change order if additional equipment or material is required to be provided by the Fabricator after the Engineer reviews the drawings, or deficiencies are identified during testing, either in the Factory or the field.

D. The Fabricator shall provide a complete and operational system as specified herein. Certain components are identified in these specifications to be provided by the Fabricator. However, the components identified shall not be construed to be the complete list of components required for the successful operation of the system as specified. The Fabricator shall provide all components and design required for the complete and successful operation of the system, conforming to all of the requirements specified herein, whether the components are identified or not. The Fabricator shall ensure that all devices are installed and operate within their intended purposes. The Fabricator shall check all catalog numbers indicated and shall coordinate all devices installed.

E. The switchgear shall be capable of unattended and manual operation as described herein. The switchgear shall be a fully coordinated system that provides the functions and features as specified herein.

F. Automatic start/stop and demand control shall be accomplished through the Genset Controllers (GC). Each generator shall have a contactor to perform the normal on line/off line paralleling functions of the generator load controlled by the GC.

G. Each generator and the distribution feeder shall have molded case circuit breakers for equipment and conductor protection.

H. The Fabricator shall fully test the switchgear separately from the generating equipment as specified herein.

1.2 RELATED REQUIREMENTS

A. Section 26 05 00 Common Work Results for Electrical

B. Section 26 05 02 Basic Materials and Methods

C. Section 26 32 13 Engine Generators

1.3 SUBMITTALS

A. Provide in accordance with Section 26 05 00 Common Work Results for Electrical and Division 1.

B. Provide complete and accurate shop drawings of the equipment including outline drawings and dimensional data which fully describe the height, width, and depth of the equipment; cabinet construction; one-line and three-line diagrams; schematics; wiring diagrams, and other relevant details.

C. The one-line diagram shall show all breakers, protective devices, and control devices and shall use standard ANSI symbols.

D. The drawings shall show the switchgear layout, shall show all terminal blocks and all connections between terminal blocks, auxiliary switch contacts, control devices, instrumentation, protection devices, etc. Drawings shall also show all details of enclosure construction.

E. Provide a bill of material for all equipment or material provided as part of the switchgear.

F. Provide manufacturer's catalog literature for all accessories and equipment.

1.4 QUALITY ASSURANCE

A. All equipment shall be designed, fabricated, and assembled in accordance with recognized and acceptable engineering and shop practices. Equipment shall not have been in service any time prior to delivery, except as required by testing.

B. The paralleling switchgear shall comply with the requirements of the National Electrical Code for Essential Electrical Systems. The switchgear shall be listed as an assembly under UL Standard 891 for switchboards or equivalent independent testing laboratory standard recognized by the State of Alaska. A nameplate indicating the listing shall be permanently affixed to each section of the switchgear.

C. The switchgear shall also be assembled and tested in strict accordance with the applicable standards of UL 891, UL 508A, NEC, ANSI, IEEE and NEMA, for metal enclosed low voltage switchgear.

D. Solid-state circuitry shall meet or exceed the Transient Overvoltage Withstand Test per NEMA ICS1-109 and the Surge Withstand Capability Test (SWC) per IEEE Standard 472 (ANSI C37.90A). In addition, where UL Standards exist for components, devices and/or assemblies, such standards shall apply.

1.5 FABRICATOR QUALIFICATIONS

A. The switchgear shall be designed and assembled by a qualified fabricator (Fabricator) who is regularly engaged in the business of providing generation switchgear. The Fabricator shall provide documentation to demonstrate experience and competence.

B. At the time of bid submittal, the Fabricator shall have current authorization from a third party listing agency to provide listed switchgear as required by the specifications. Evidence of authorization may be requested by the Authority after the bid opening in order to verify Fabricator qualifications.

1.6 CONTRACTOR WARRANTIES

A. The Contractor shall warrant the work for a period of not less than one-year after energization of the equipment. In the event of equipment or component failure during the warranty period, the Contractor shall replace such defective equipment or components and bear all associated costs. The Contractor shall pursue manufacturer's warranties to the extent necessary to obtain replacement equipment and provide proof of action taken upon request. Assist Authority as directed in determining cause of failure.

B. The warranty shall state in clear terms exactly what warranty coverage the seller provides, for each unit and attachments. This shall include the terms, length of coverage, reporting responsibilities, how the warranty applies to accessory equipment, restrictions, locations of local facilities for handling warranty and other repairs (including contact names), and any other available information pertaining to warranty.

C. Provide a nametag on each piece of equipment that clearly identifies the party responsible for the warranty. Nametag shall include the name, address, and phone number, and shop order or Fabricator’s serial number.

1.7 OPERATION AND MAINTENANCE MANUALS

A. Provide an operation and maintenance (O&M) manual for the switchgear. The O&M manual shall be furnished in a single PDF file organized by sections with tabs and bookmarks.

B. Include the following information in the O&M manual:

1. Equipment function, normal operating characteristics, and limiting conditions.
2. Assembly, installation, alignment, adjustment, and checking instructions.
3. Operating instructions for start-up, routine and normal operation, regulation and control, shutdown, and emergency conditions.
4. Guide to "troubleshooting."
5. Parts lists, with vendor name and telephone number, and predicted life of parts subject to wear.
6. Complete as-built drawings showing all details of construction.

PART 2 - PRODUCTS

2.1 GENERAL

All equipment and material shall be new. Equipment furnished and installed under this section shall be fabricated and assembled in full conformity with the drawings, specifications, engineering data, instructions, and applicable standards.

2.2 ACCEPTABLE MANUFACTURERS OF SWITCHGEAR COMPONENTS

Specific parts manufacturer and model have been specified in the following paragraphs not only to meet performance function but also to coordinate and interface with other devices and systems. Approved equal substitutions will be allowed only by Engineer's approval. To obtain approval, submittals must clearly demonstrate how substitute item meets or exceeds specified item quality and performance characteristics and also complies with electrical connections and physical layout requirements. Acceptable manufacturers of all components not otherwise indicated shall be: Allen-Bradley, Eaton, General Electric, IDEC, Siemens, or Square D.

2.3 SWITCHGEAR ENCLOSURE

The following paragraphs describe general fabrication requirements for the switchgear enclosure.

A. Provide a freestanding enclosure that is factory built, wired, and tested by the switchgear manufacturer. Hinged front-opening doors shall provide required access to all components. Control wire shall have termination identification of each wire for ease of tracing. Terminal blocks shall be provided for control wires that run between the switchgear and external equipment such as generator sets. Nameplates shall be provided to identify each device or function.

B. The switchgear shall be front access for all control devices.

C. All switchgear sections shall be dead front type NEMA 1A construction and safety labeled per UL-891 or equivalent. The enclosure shall be divided into individual sections as indicated on the design drawings. The maximum dimensions of each section shall be as indicated by the enclosure layout detail on the design drawings. All sections shall be rear aligned and shall be capable of being rolled, moved or lifted into the installation position and bolted directly to the floor without the addition of floor sills. Each switchgear section shall be a completely self-supporting structure. Individual sections shall be bolted together to form the required arrangement.

D. The structure frame shall be die formed 12 gauge steel with reinforcing corner gussets internal and external to the structure members. Alternatively, a 2”x 2”x 3/16” steel angle frame may be used. Bolt-on side, top and rear covers shall be code gauge steel, minimum.

E. Each section shall be provided with an individual door. Doors shall be provided with latches and concealed hinge construction.

Latches shall be one of the following.

1. One three-point single handle operated latch.

2. Multiple single-point latches consisting of captive knurled handle quarter-turn cam fasteners. Doors which are 36 inches or less in height shall have a minimum of two single-point latches; doors which are greater than 36 inches in height shall have three single-point latches.

F. The individual generation sections shall be divided into high and low voltage cubicles using interior barrier panels to ensure isolation of equipment for safety to personnel during service and maintenance or cable pulling. The upper portion of the generator cubicles shall be the low voltage (120V max) controls cubicle. The lower portion of the generator cubicles shall be the high voltage (480V) power cubicle.

G. The control cubicles shall be provided with back and or side pans as required for mounting equipment and wiring. Mounting attachments shall be welded studs or other approved methods. No bolts, screws, or other attachment hardware shall be visible from the exterior.

H. Power and control cables shall enter from the top of the enclosure as indicated by the enclosure layout detail on the design drawings. A cable area shall be provided behind the controls cubicle of each engine/generator cubicle to allow power cables to be installed behind the controls cubicle of the appropriate cubicle. Isolation barriers shall be provided between each cable area such that each cubicle is completely isolated from any adjacent cubicle. Where top cable entry is indicated by the enclosure layout detail on the attached drawings, a removable cover plate shall be installed on top of the cable area large enough to terminate a 3" rigid conduit with locknuts and conduit bushing. The removable cover plate shall cover the entire cable area.

I. Where the main bus is not isolated by barrier plates, it shall be provided with a glastic cover for isolation over the entire length of the bus.

J. The top of the GC shall not exceed 60" above the bottom of the switchgear.

K. Doors shall be provided with door latches and concealed hinge construction.

Latches shall be one of the following.

1. One three-point single handle operated latch.

2. Multiple single-point latches consisting of captive knurled handle quarter-turn cam fasteners. Doors which are 36 inches or less in height shall have a minimum of two single-point latches; doors which are greater than 36 inches in height shall have three single-point latches.

2.4 PAINTING

A. Steel and iron surfaces shall be protected by suitable paint or coatings applied in the shop. Surfaces that will be inaccessible after assembly shall be protected for the life of the equipment. Surfaces shall be cleaned and prepared in the shop. All mill scale, oxides, and other coatings shall be removed.

B. All metal enclosure parts shall be phosphatized to ensure that the metal is properly degreased and cleaned.

C. Exposed surfaces shall be finished smooth, thoroughly cleaned and filled as necessary to provide a smooth uniform base for painting and painted with one or more coats of primer and two or more finish coats of alkyd resin machinery enamel or lacquer as required to produce a smooth hard durable finish. The color of the finish coats shall be light gray.

D. Provide a premium painting system throughout the painting process from initial cleaning to final assembly to assure a superior paint finish. All coatings shall be applied using an electro static paint system.

E. Interior shall be light gray, except that back and side pans shall be white.

F. All parts of the switchgear enclosure shall be painted. No interior surfaces may be left unpainted except interior surfaces may be galvanized.

2.5 CONTROL WIRING

A. All control wiring shall be minimum 600 volt, copper 16-gauge, strand type SIS wire or equivalent. The Fabricator shall be responsible for sizing the appropriate wire for each component and circuit. Current transformer wiring shall be 12 gauge wire. All wires for control wiring shall have insulated spade type lugs, except where compression terminals are used. All current transformer leads shall be provided with insulated ring-type lugs. All lugs shall be tin-plated copper.

B. Only one wire shall be inserted in a lug. Lugs shall be installed with a ratcheting type crimping tool. All wires shall be tagged with wire markers at both ends.

C. All wiring shall terminate on terminal blocks or devices. No more than two wires shall be connected to a termination point. Terminal blocks for control wiring shall be 20 amp, 600 volt. All terminal blocks and exposed relays located in the controls compartment shall be provided with a plastic safety cover. Terminal blocks for DC circuits shall be separated from terminal blocks for 120 VAC.

D. Current transformer leads shall be wired to shorting type terminal blocks. Shorting pins shall be provided with storage locations for the shorting pins.

E. Terminal blocks shall be clearly labeled and shall match the designation shown on the Fabricator's drawings.

F. Each end of each wire shall be identified per the marking and numbering shown on the wiring drawings with heat shrink or wrap-around adhesive labels. Each conductor shall have the terminal or device the conductor is terminated to at both ends positively identified at both ends of the conductor.

G. Wiring shall be installed neatly in bundles and wireways. Adhesive backed tywrap bases shall not be used to support bundles. All wiring bases shall be securely attached with metal screws.

2.6 BUS BAR AND GROUNDING

A. The switchgear shall be provided with silver-plated copper main bus bars. The main bus shall be rated 600 amperes. If the actual ampacity of the bus installed exceeds this value, the switchgear bus shall be rated 600 amperes.

B. Isolated copper neutral bus and ground bus shall be provided and shall have the same ratings as the main bus.

C. The main bus shall be well braced to meet the short circuit ratings of the generators. Minimum bus bracing shall be 30,000 amperes symmetrical. The main bus shall be installed on insulators to provide proper clearances between phases and phase to ground.

D. The station service and radiator circuit breakers shall be connected to the main bus by cables.

E. The generator contactors shall be connected to the main bus by cables.

F. Termination lugs shall be provided on the line side of the generator breakers. Lugs shall be suitable for termination of #4/0 AWG cable.

G. Termination lugs shall be provided on the load side of the feeder breaker. Lugs shall be suitable for termination of #4/0 AWG cables, minimum 2 for each phase. The spacing of the lugs shall be NEMA 2-hole, 1.75" on center.

2.7 SWITCHGEAR DEVICES.

A. Nameplates. All nameplates shall be black with white core type. Nameplates shall have beveled edges and shall be secured with a minimum of two mounting screws. Nameplates shall be provided for each device on the front of the switchgear and inside the switchgear. Inside the switchgear compartments, all relays, control switches, lights, etc. to which control or instrument transformer wiring connects, shall be marked by nameplates, with designations corresponding to the same device designations used on the wiring drawings and approved by the Engineer. Nameplates inside the switchgear located on swingout doors may be attached using adhesive epoxy.

B. Overall nameplate. Provide an overall nameplate that provides the following information:

1. Fabricator's name and address.
2. Fabricator's type designation (optional).
3. Fabricator's shop order number.
4. Third party listing identification.
5. Rated maximum voltage.

C. Third Party Listing Tag. Provide a tag identifying the third party listing of the equipment. If the enclosure was fabricated by a subcontractor, the enclosure shall be provided with the third party listing tag. The overall assembly shall also be provided with a third party listing identification tag that meets the requirements of the State of Alaska.

D. Selector Switches. Selector switches shall be heavy-duty type. Contacts shall have silver butting or sliding contacts, rated 10 amperes continuous at 120 volts AC. Contact configuration shall be as required for the application. Legends shall be engraved on the switch nameplate.

Unless otherwise specified, all selector switches located on the front of the enclosure shall be Electroswitch Series 24, or approved equal.

E. Annunciator Lights. Annunciator lights shall be panel mount LED cluster type lamps. IDEC Corp. Series SLC40, or approved equal.

F. Control Relays/Time Delays. Relays and timers for control operations or isolation shall be of the plug-in socket base type with dustproof plastic enclosures unless noted otherwise. Relays and timers shall be UL recognized, have 120-volt AC or 24-volt DC coils, depending on the application. Relays shall not have less than double-pole, double-throw contacts. Control circuit relays shall have silver-cadmium oxide contacts rated for 10 amperes at 120 volts AC. Electronic switching duty relays shall have gold-plated or gold alloy contacts suitable for use with low-level signals. Relays utilized for alarm input or indicating light service shall have contacts rated not less than 3 amperes. All relays and timers shall be provided with indicating lights. IDEC Corp. or approved equal.

G. Relays for use on 24-volt DC circuits shall be provided with different bases than those for use on 120-volt AC circuits to prevent inadvertent swapping of relays.

H. Auxiliary power relays shall be Allen-Bradley series 700, min 20A rated, or approved equal.

I. Circuit Breakers.

1. Protective devices shall be resettable circuit breaker type for all AC and DC circuits in the switchgear. Replaceable fuse type devices are not acceptable.

2. Circuit breakers shall be molded case circuit breakers of the amperage, voltage, short circuit capacity, and number of poles required for the application or as indicated on the one-line diagram.

3. The generators, feeder, radiators, and station service transformer shall be protected by manually operated molded case circuit breakers, sized as indicated on the one-line diagram. The generators, feeder, and station service circuit breakers shall be mounted in the face of the switchgear and shall be provided with a protective guard. The radiator circuit breakers shall be mounted inside the switchgear.

4. Auxiliary contacts shall be provided on the generator circuit breakers to indicate breaker position. The closed position contact shall be wired to the GC to provide alarm indication any time the breaker is not closed (either tripped or manually opened).

J. Current Transformers. Instrument current transformers shall be specifically designed for installation in switchgear. The design shall coordinate the thermal,

mechanical, and insulation limits of the current transformers with those of the breakers and bus of the switchgear in which they are to be installed. Current transformers shall be of the wound or window type, with silver-plated primary terminals. Insulation shall be suitable for 600 volt.

1. Current transformers for relay service shall be provided with a minimum C20 accuracy class with a rating factor of 2.0.

2. Current transformers for totalizing and feeder meters shall be metering class with a minimum 0.3% accuracy and with a rating factor of 2.0.

3. Current transformers for the station service meter shall be metering class with a minimum 0.3% accuracy.

4. Current transformers identified as multi-ratio shall be provided in the ratios indicated and shall be provided with the accuracy specified at full distributed windings.

K. Potential Transformers. Instrument rated potential transformer shall be provided in the quantity and ratio as indicated on the drawings.

1. All potential transformers shall have primary and secondary protection using circuit breakers as specified herein.

2. All potential transformer grounds shall be made directly to switchgear ground bus.

2.8 POWER DEVICES

A. Provide all power devices as indicated on the one-line diagram and required for the proper operation of the switchgear and generator. At a minimum, provide the following devices:

1. Incoming circuit breaker. Provide auxiliary contacts to indicate circuit breaker position. The closed position contact shall be wired to the GC to provide alarm indication any time the breaker is not closed (either tripped or manually opened). Indicate breaker position on the front of the switchgear as specified elsewhere. The circuit breaker shall be rated as indicated on the drawings.

2. Generator Contactor. The generator shall have an electrically operated contactor to perform the normal on line/off line paralleling functions of the generator load controlled by the GC. The contactor shall have auxiliary contacts as required for control and indication as specified herein. The contactor shall have an ampere rating as indicated on the drawings and shall be NEMA or IEC rated.

2.9 METERING EQUIPMENT

A. Totalizing (Bus) and Station Service Meters. Class 10 current inputs, 120VAC input, 18-60 VDC power supply. Provide with Ethernet communications port, panel mount remote display module, and cable. SHARK 200-60-10-V2-D-INP100S-X or approved equal.

B. Provide all cables, connectors, and other devices including CT shorting terminal blocks as required for a complete and operational metering system.

2.10 CONTROL POWER

A. Control power for the switchgear shall be 24 VDC. All meters and other components requiring auxiliary power to operate shall operate from this control power source, unless otherwise specified. The engine start and run signals and all control circuits shall be 24 VDC unless otherwise specified.

B. The 24VDC control power source shall be the engine starting batteries. Each engine battery supply shall enter in the respective generator cubicle. A 20A circuit breaker shall be installed on each engine battery input. The 24V outputs from each engine section shall be connected together through a power bridge rectifier, minimum 30A, rated, Semikron or equal. This rectified power shall be the master control power source.

C. Each major device or meter shall be individually protected by circuit breakers. Fuses will not be acceptable. Clearly mark each circuit breaker for the intended service.

2.11 GENERAL CONTROL SPECIFICATIONS

A. The switchgear shall provide controls to automatically and manually connect and parallel both engine generator sets to the switchgear main bus. The genset controllers (GC) shall control the overall sequencing and starting and stopping of the generators. The GC shall control all functions and features of the individual generator, both manual and automatic. The GC shall start, stop, synchronize, and provide load sharing of the generator. Each GC shall communicate with the other GC for load sharing information. If the communications bus is disabled, the GC shall be fully capable of operating the individual generator.

B. Automatic start and demand control shall be performed by the GC.

C. The GC shall be configured to perform all engine and generator control and safety functions specified herein.

D. The GC shall be configured to control the engine speed using 0.25-4.75VDC signal connected to the engine ECU.

E. The generator voltage regulator and droop current transformer will be provided by others and located at the generator terminal cabinet. The GC shall be configured to control the voltage regulator through the voltage regulator auxiliary voltage bias input.

2.12 ENGINE FUNCTION MONITORING

A. Through the GC, provide remote monitoring and control based on the following sensors and switches for each engine:

1. J1939 CAN bus from engine ECU. Use for monitoring of engine speed, jacket water temperature, lubricating oil pressure, intake air temperature, and fuel flow rate.

2. Oil Level Switch. A normally open switch will close when the oil level rises above or drops below pre-determined levels.
3. Coolant Level Switch. A normally open switch will close when the coolant level drops below a pre-determined level.
4. Log and maintain run time on the engine. Time shall be expressed in hours and minutes.

2.13 ENGINE-GENERATOR SECTION CONTROL AND MONITORING

The following components shall be supplied for each generator section to allow automatic or manual operation and control of the generators. Note that some components have been specified under prior sections.

A. Genset Controller (GC) – Door mounted style with display face, Woodward easYgen Model 3200XT-P1, Part Number 8440-2082 or approved equal. Furnish with one each digital I/O expansion module, 8 inputs, 8 outputs, din rail mounting, 24 VDC control voltage. Woodward Part Number 8440-2028 or approved equal.

B. The GC shall perform the cranking and disconnecting of the starter using feedback from the magnetic pickup, located on the engine, and shall power the engine speed control module. The engine speed shall be controlled using 0.25-4.75VDC signal connected to the engine ECU. The GC shall also perform automatic paralleling, load sensing, generator protection, automatic synchronization, and contactor control. The GC discrete outputs shall be used for safety shut downs, and annunciation.

C. Annunciation LED's, mount near top of cabinet, left to right:

1. Engine Run (green).
2. Normal Stop (amber)
3. Alarm/Lockout (red).
4. Breaker Open (red).
5. Spare.
6. Spare.

D. Generator molded case circuit breaker with auxiliary contacts, size as indicated on the one-line diagram on the design drawings.

E. Generator contactor with auxiliary contacts, size as indicated on the one-line diagram on the design drawings. The contactor shall perform the normal on line/off line functions of connecting the generator to the bus. The contactor shall have auxiliary contacts that shall be wired to the GC to indicate status. Contactors shall be cabled to circuit breakers, sized per circuit breaker current rating.

F. Lock Out Switch. Key operated RUN/OFF switch mounted in panel face next to GC, Cutler-Hammer 10250T1511-2 or approved equal. Switch shall be labeled "Generator Lockout for Service". When in the OFF position the switch shall disable the GC and prevent engine starting. All switches for the entire project

shall utilize a common key. Provide two keys for each engine section. Provide the following position indication LED's immediately above the switch:

1. Contactor Closed (red).
2. Contactor Open (green).

G. Current and Potential Transformers, quantity and size as indicated on the one-line diagram on the design drawings. Provide current transformers with shorting terminal blocks.

H. 24 VDC 20A circuit breaker for control power.

2.14 MASTER SECTION CONTROL AND MONITORING

The following components shall be supplied for the master section. Note that some components have been specified under prior sections.

A. Feeder Circuit Breaker: Manually operated, with shunt trip and auxiliary contact, size as indicated on the one-line diagram on the design drawings.

B. Station Service Circuit Breaker: Manually operated, size as indicated on the one-line diagram on the design drawings.

C. Totalizing (Bus) Meter.

D. Station Service Meter.

E. Emergency Stop Button, maintained pushbutton with guard.

F. Dead bus relay. IDEC or approved equal. Dead bus relay to active feeder shunt trip upon loss of power on the bus.

G. Diode bridge and 24 VDC circuit breakers for control power.

H. Current and Potential Transformers, quantity and size as indicated on the one-line diagram on the design drawings. Provide current transformers with shorting terminal blocks.

I. Terminal Blocks, Relays, Timers, Bases, Etc. Quantity as required.

2.15 RADIATOR CONTROL AND MONITORING

The following components shall be supplied for control of two radiators and installed in the master section. Note that some components have been specified under prior sections.

A. Circuit Breaker: Manually operated, size as indicated on the schematic on the design drawings. Provide one for each radiator.

B. Contactor: Operated by Temperature Controller, furnish with overload, size as indicated on the schematic on the design drawings. Provide one for each radiator.

C. Temperature Controller: DIN rail or surface mount multi-function temperature controller for heating and cooling applications, 120/240VAC, minimum 1 HP motor rated contacts at 120VAC, -40°F TO 212°F control range, On and OFF adjustable in 1°F increments. Furnish complete with matched temperature sensor and adapter well for1/2" NPT process connection Johnson Controls Penn

A421ABC-02C with WEL11A-601R or approved equal. Provide one for each radiator.

D. Control Power Transformer: 277-120VAC transformer for control power to Temperature Controllers and Contactor.

2.16 GENERATION SEQUENCE OF OPERATION.

A. A complete and successfully operating system shall be provided for starting, stopping, and paralleling, both automatically and manually, all generator units. A total of two generator units shall be provided. The following paragraphs describe the basic functional requirements of the system. The Contractor shall be responsible for the detailed design to provide a safe and satisfactorily functioning system.

B. Control system arrangement shall be such that the genset controllers (GC) shall perform the load sensing, automatic start and stop of each unit, synchronization, governor control, generator protection, load share, and voltage compensation. Failure of the automatic control system shall not prevent the manual operation of the system to start, stop, or synchronize any one, or all, of the generating units.

C. Automatic Operating Conditions: With each GC in the "Auto" position, the following sequences of operation shall be performed:

1. Initial dead-bus startup, both generating units will start and come up to rated speed. The first unit to stabilize will close to the dead bus. The remaining unit will auto-synchronize to that unit and close to the bus. Note that the feeder breaker will need to be manually closed after the system is stabilized.

2. With both units operating, both GC's in the "Auto" position, and the feeder breaker closed: the GC for Gen #1 shall monitor load on the bus and determine if Gen #1 or Gen #2 is required in accordance with the Demand Table. If Gen #1 is adequate, the system shall then unload and shut down Gen #2.

3. When the load rises above the Raise Level the GC shall automatically start, synchronize, and connect Gen #2 to the bus shall then unload and shut down Gen #1.

4. When the load falls below the Lower Level the GC shall automatically start, synchronize, and connect Gen #1 to the bus shall then unload and shut down Gen #2.

5. If only one unit is operating and is dropped from the bus, for any reason, the system shall perform a dead bus start up sequence as previously specified.

6. If only one unit is operating and that unit is changed from Auto to Manual the system shall start the other unit and place it on line.

7. On a normal shut down the GC shall run the engine for 3 minutes after being taken off line for cool down and then stop the engine.

D. Demand Table: The load share function shall be in accordance with the following.

DEMAND LEVEL	GENERATOR	PRIME RATING (kW)	RAISE LEVEL	LOWER LEVEL
1	#1	65	55	
2	#2	180		45

E. Engine and Generation Alarm Conditions and Sequences: Note that these apply to both Auto and Manual operation.

1. Provide the following types of alarm sequences for each condition listed below:

   a. Type A (Engine Alarm Soft Shutdown – F2): Upon alarm condition bring another generator on line, unload the first generator, open the contactor, run through a cool down cycle, shut down engine. Illuminate "Alarm/Lockout" light, and display alarm description on the face of the GC. Unit shall be locked out and alarm light shall remain illuminated until the problem is corrected and the GC is manually reset.

   b. Type B (Engine Alarm Hard Shutdown – F3): Upon alarm, immediately open the contactor and shut down without going through a cool down cycle. . Illuminate "Alarm/Lockout" light, and display alarm description on the face of the GC. Unit shall be locked out and alarm light shall remain illuminated until the problem is corrected and the GC is manually reset

   c. Type C (Generation Alarm): Upon alarm, immediately open the contactor and shut down without going through a cool down cycle. Illuminate "Alarm/Lockout" light, and display alarm description on the face of the GC. Unit shall be locked out and alarm light shall remain illuminated until the problem is corrected and the GC is manually reset.

2. For the following engine/generator alarm conditions perform the sequence indicated:

   a. Low Oil Pressure - Provide a Type A shut down when the oil pressure drops to the pre-alarm level of 10 psig, adjustable, and stays below that level for 5 seconds, or if the signal is lost to the pressure transducer. Provide a Type B shutdown when the oil pressure drops to the alarm level of 6 psig, adjustable.

b. Oil Level - Provide a Type A shut down when the oil level switch closes.

c. High Coolant Temperature - Provide a Type A shut down when the jacket water temperature reaches the pre-alarm level of 210°F, adjustable, and stays above that level for 30 seconds or if the signal is lost to the temperature transducer. Provide a Type B shutdown when the jacket water temperature reaches the alarm level of 215°F, adjustable.

d. Over Speed - Provide a Type B shutdown on overspeed.

e. Fail To Start - If a unit fails to start after the over crank time delay has expired, lock it out, illuminate the alarm lamp, and display alarm description on the face of the GC.

f. Running Timeout - If the engine runs without being placed on line for 5 minutes, adjustable, shut down the engine, lock it out, illuminate the alarm lamp, and display alarm description on the face of the GC.

g. Fail to Synchronize - Provide a Type C shutdown if a unit fails to synchronize after a preset time delay.

h. Over Current - Provide a Type C shutdown on operation of an overcurrent element.

i. Under Voltage - Provide a Type C shutdown on operation of an under voltage element.

j. Over Voltage - Provide a Type C shutdown on operation of an over voltage element.

k. Under Frequency - Provide a Type C shutdown on operation of an under frequency element.

l. Over Frequency - Provide a Type C shutdown on operation of an over frequency element.

m. Reverse Power - Provide a Type C shutdown on operation of a reverse power element.

n. Circuit Breaker Trip – When the generator circuit breaker is open (tripped or manually opened) illuminate the alarm lamp.

3. For the following system alarm conditions perform the sequence indicated:

a. Emergency Stop - Upon receipt of a contact closure from the Emergency Stop Pushbutton, all engines shall be shut down without going through a cool down sequence. The system shall remain in a lockout condition and no units shall be started either manually or automatically until the alarm is cleared.

b. Low Coolant Level – Opening of the low coolant alarm contact on the system low coolant level switch, all engines shall be shut down without going through a cool down sequence. The system shall remain in a lockout condition and no units shall be started either manually or automatically until the alarm is cleared.

c. Fire Alarm – Note that the present system will not have a fire alarm system but the switchgear shall have provisions for connection of a future system. Upon receipt of a contact closure from the fire alarm system, all engines shall be shut down without going through a cool down sequence. The system shall remain in a lockout condition and no units shall be started either manually or automatically until the alarm is cleared.

PART 3 - EXECUTION

3.1 FACTORY TESTS

A. Prior to shipment, the Low-Voltage Switchgear Fabricator shall perform factory tests at the shop where the switchgear is assembled. Provide certified copies of all manufacturers' test data and results. Supply sufficient notice to the Authority prior to performing tests. The Authority reserves the right to witness all tests. Test procedures shall conform to ASME, IEEE, and ANSI standards, and NEMA standard practices section on testing, as appropriate and applicable.

B. The Fabricator shall provide all required equipment and measuring and indicating devices required to perform the tests indicated. All devices shall be certified correct or correction data furnished for the device.

C. Tests shall indicate satisfactory operation and attainment of guarantees and specified performance. Fabricator shall not ship equipment without approval by the Authority of the shop test reports.

D. If the Authority elects to witness the testing, prior to actual witness testing by the Authority, the Fabricator shall conduct sufficient tests and provide the test reports to the Authority to ensure that when the witness test is performed, the equipment will operate as specified. At a minimum, provide the following operational tests:

1. Verify that the system performs the sequence of operations as described above. Verify that the equipment performs each task as specified.

2. Verify all protective relay functions.

3. Verify that each annunciation point operates correctly. For external alarms, simulate the alarm.

E. Perform the following electrical test and inspections of the switchgear:

The switchgear equipment and circuit breakers shall receive factory production tests as listed below:

1. Equipment.

a. Low frequency dielectric test.
b. Grounding of instrument cases.
c. Control wiring and device functional test.
d. Polarity verification.
e. Sequence test.
f. Low frequency withstand voltage test on major insulation components.
g. Low frequency withstand test on secondary control wiring.

2. Main Bus: Megger test at 1000 volts each bus to ground and phase-to-phase.

3. Contactors:
a. Coil check test.
b. Clearance and mechanical adjustment.
c. 300 Electrical and mechanical operation test.
d. Conductivity of current path test.

F. Tests that are provided by the manufacturer of the equipment need not be duplicated. However, documentation shall be provided that the test was performed.

G. Perform multiple repetitions of individual operations as required by the Authority to adequately demonstrate satisfactory operation of all functions.

3.2 NOTIFICATION OF WITNESS TESTING

A The Authority shall have the right to inspect, at the factory, all equipment covered by these specifications any time during manufacture and assembly and to be present during any tests made on the equipment.

B The Authority may visit the manufacturing facility for final performance testing. The Fabricator shall make a technician available to the Authority to assist in the inspection and witness test of the switchgear. The technician shall instruct the Authority in all functions of the equipment.

C The Fabricator shall notify the Authority two weeks in advance of the scheduled test date. If the Fabricator ships the equipment without allowing the Authority to witness testing of the equipment, or before the Authority accepts the equipment test, the Authority reserves the right to have a third party test the equipment in Anchorage, Alaska or at the F.O.B. destination. All costs associated with a third party test shall be deducted from the Fabricator's final payment. If the switchgear fails any test, the Fabricator shall be responsible for correction of all deficiencies, retesting, and proving the switchgear operates as specified and meets the requirements of these specifications with no increase in the contract price.

END OF SECTION

SECTION 26 32 13.10
ENGINE GENERATORS

PART 1 - GENERAL

1.1 SCOPE

A. The Work included herein shall consist of providing, fabricating, and factory testing complete engine generator packages as specified herein.

B. Each unit shall be harmonically balanced and shall be delivered complete and ready for installation.

C. Provide all accessories as specified for all engine generator units plus any additional components listed.

1.2 RELATED REQUIREMENTS

A. Section 26 05 00 Common Work Results for Electrical

B. Section 26 05 02 Basic Materials and Methods

C. Section 26 05 33 Raceway and Boxes for Electrical Systems

1.3 SUBMITTALS

A. Provide in accordance with Division 1 requirements.

B. Provide complete and accurate drawings of the equipment, including outline drawings and dimensional data which fully describe the height, width, and depth of the equipment; skid construction; schematics; wiring diagrams; and other relevant details.

C. Provide mechanical and electrical performance data including intake and exhaust air flow; charge air cooling requirements (if applicable); heat rejection; engine coolant pump curve at rated speed; fuel flow rate; fuel consumption at 100%, 75%, 50%, and 25% of rated prime power; and other relevant data.

D. A torsional vibration analysis (TVA) has been prepared for the specified Engine Generator No. 1 combination which includes a Newage/Stamford UCI274H generator and a John Deere 6081AFM75 engine with the following option codes: Crankshaft & Bearing #4705, Flywheel #1505, and Pulley/Damper #1345 or #1307. A TVA is NOT required to be provided if the Contractor offers the specified generator and specified engine with these option codes. If a substitute generator or engine is offered, or if the engine does not have the specified option codes, the Contractor shall provide a TVA for the proposed engine generator combination within 14-days of contract award.

E. A torsional vibration analysis (TVA) has been prepared for the specified Engine Generator No. 2 combination which includes a Newage/Stamford UCI274C generator and a John Deere 4045AFM75 engine with the following option codes: Crankshaft & Bearing #4715, Flywheel #1597, and Pulley #1333. A TVA is NOT required to be provided if the Contractor offers the specified generator and specified engine with these option codes. If a substitute generator or engine is offered, or if the engine does not have the specified option codes, the Contractor

shall provide a TVA for the proposed engine generator combination within 14-days of contract award.

F. Provide manufacturer's catalog literature for all accessories and equipment.

1.4 REGULATORY COMPLIANCE

The Environmental Protection Agency (EPA) has issued New Source Performance Standards (NSPS) regulations governing use of stationary diesel engines in remote areas of Alaska. The following provisions of 40 CFR Subpart IIII apply to this project:

A. 40 CFR 60.4201(f) permits manufacturers to produce stationary, non-emergency engines certified to 40 CFR 94 and 40 CFR 1042 (Tier 2 and Tier 3 Marine) if used solely in remote areas of Alaska.

B. 40 CFR 60.4208(e) prohibits owners and operators from installing a new engine greater than or equal to 175 HP and less than 750 HP after December 31, 2012 unless it meets applicable 2011 model year emissions requirements. (A new Tier 2 Marine certified engine complies with this requirement because Tier 3 Marine engines in this horsepower category were not produced until model year 2014).

C. 40 CFR 60.4216(b) permits manufacturers, owners and operators to install engines in remote areas of Alaska certified to 40 CFR 94 and 40 CFR 1042 (Tier 2 and Tier 3 Marine).

In order to comply with EPA emissions requirements and also be compatible with the intended service applications, the diesel engines furnished under this solicitation shall be Tier 2 Marine certified engines, with a manufacture date prior to model year 2014. If the engine is rebuilt it shall be rebuilt in accordance with the requirements of 40 CFR 1068 and applicable NSPS standards.

1.5 QUALITY ASSURANCE

A. All equipment shall be designed, fabricated, and assembled in accordance with recognized and acceptable engineering and shop practices. Individual parts shall be manufactured to standard sizes and gauges so that repair parts, furnished at any time, can be installed in the field. Like parts of duplicate units shall be interchangeable. Except where specific allowance is made in this specification for rebuilt or remanufactured engines, Equipment shall not have been in service at any time prior to delivery, except as required by tests.

B. Equipment and components furnished under these specifications shall be in accordance with the requirements of applicable UL, NEC, IEEE, NEMA, and ANSI standards.

1.6 FABRICATOR QUALIFICATIONS

The engine generators shall be supplied, coordinated, and assembled by a qualified fabricator (Fabricator) who is regularly engaged in the business of providing diesel engine driven generator equipment.

A. The Fabricator must have staff with extensive experience in packaging diesel engine driven electrical generators. A list of five prior projects that key staff have worked on may be requested by the Authority after the bid opening and prior to

award in order to verify Fabricator qualifications. The list must include installation date, description of installation, and a reference contact for each installation.

B. The Fabricator must maintain a competent service organization that is available for field service calls. A description of the organization including resumes of key personnel may be requested by the Authority after the bid opening and prior to award in order to verify Fabricator qualifications.

C. The Fabricator must have a fabrication facility with adequate space and appropriate equipment as required to perform the work. The Authority may inspect the Fabricator's shop after the bid opening and prior to award in order to verify Fabricator qualifications.

1.7 CONTRACTOR WARRANTIES

A. The Contractor shall warrant the work for a period of not less than one-year after energization of the equipment or 18 months after delivery to the F.O.B. point, whichever comes first. In the event of equipment or component failure during the warranty period, the Contractor shall replace such defective equipment or components and bear all associated costs. Costs shall include material, parts, and labor. The Contractor will be allowed to charge for travel and perdiem expenses related to warranty service at actual cost plus 10%. The Contractor shall pursue manufacturer's warranties to the extent necessary to obtain replacement equipment and provide proof of action taken upon request. Assist Authority as directed in determining cause of failure.

B. The warranty shall state in clear terms exactly what warranty coverage the seller provides, for each unit and attachments. This shall include the terms, length of coverage, reporting responsibilities, how the warranty applies to accessory equipment, restrictions, locations of local facilities for handling warranty and other repairs (including contact names), and any other available information pertaining to warranty.

C. Provide a nametag on each piece of equipment that clearly identifies the party responsible for the warranty. Nametag shall include the name, address, and phone number, and shop order or Contractor's serial number.

1.8 OPERATION AND MAINTENANCE MANUALS.

A. Provide one (1) complete bound set of operation and maintenance (O&M) manuals for each unique engine generator unit. Identification symbols for all replaceable parts and assemblies shall be included. Provide manuals for the following equipment:

1. Engine.
2. Generator.
3. Voltage Regulator.
4. All accessories.

B. For each engine provide all available factory service publications including parts manuals, service manuals, component technical manuals, etc.

C. For all other components of each engine generator unit provide:

1. Equipment function, normal operating characteristics, and limiting conditions.
2. Assembly, installation, alignment, adjustment, and checking instructions.
3. Operating instructions for start-up, routine and normal operation, regulation and control, shutdown, and emergency conditions.
4. Lubrication and maintenance instructions.
5. Guide to "troubleshooting."
6. Parts list and predicted life of parts subject to wear.
7. Outline, cross section, elevation, and assembly drawings
8. Engineering data including all mechanical and electrical performance characteristics.
9. Complete AC connection and three-line diagrams.
10. Complete DC schematics including voltage regulator, fuel injector pump, sensors, switches, fuses, and all other devices.

D. The operation and maintenance manuals shall be in addition to any instructions or parts list packed with or attached to the equipment when delivered, or any information submitted for review.

E. Each copy of the final O&M manual shall be provided with original copies of the manufacturer's instruction books. Copies of manufacturer's instruction books shall not be inserted in any of the final O&M manuals.

F. Bind materials in locking three ring "D" style binders. Binder capacities shall not exceed 3 inches, nor shall material included exceed the designed binder capacity. If material to be bound exceeds capacity rating, multiple volumes shall be furnished. Binder capacity shall not be less than approximately 1/2 inch greater than the thickness of the material within the binder. Permanently label with project information on the front cover and edge.

G. Where reduction is not practical, larger drawings shall be folded separately and placed in envelopes, which are bound into the manuals. Each envelope shall bear suitable identification on the outside.

H. All information in the O&M manuals shall be new and original publications.

I. All as-built drawings shall be provided in Adobe PDF format on CD.

PART 2 - PRODUCTS

2.1 GENERAL CONFIGURATION AND MANUFACTURERS

A. All units shall be complete skid mounted engine generators utilizing all new components except where specific allowance is made for rebuilt engines.

B. All units shall be configured as specified herein and shall include all accessories as indicated.

C. Engines shall have a manufacture date prior to Model Year 2014. The engine shall be new or at Contractors option rebuilt in accordance with Section 26 32 13.20.

D. Engines shall be rated for prime power duty at the horsepower (shaft) and electrical kilowatt (generator) ratings indicated for each unit. All engines shall be

1800 RPM unless specifically indicated otherwise. All starting systems shall be 24 VDC and all engine control (ECU) systems shall be 12 VDC.

E. Provide engines of the manufacturer and model indicated in the Specific Configuration requirements that follow, no other substitutes except as specifically noted below.

F. Approved equal substitutions of engines will be allowed only by Engineer's approval. To obtain approval, submittals must clearly demonstrate the following:

1. The substitute engine must meet all of the requirements of Section 2.3
2. The substitute engine manufacturer must have at least one factory authorized service representative with a permanent shop in Southcentral Alaska.
3. The size and weight of the substitute engine must not exceed that of the specified engine by more than 10%.
4. The physical layout, piping connections, and service access area of the substitute engine must be sufficiently similar to that of the specified engine so that no major changes will be required to the power plant design. The engine must not be equipped, or require to be equipped, with any exhaust emissions equipment including Exhaust Gas Recirculation, Diesel Oxidation Catalyst, Diesel Particulate Filter, or Selective Catalytic Reduction.
5. The substitute engine must meet or exceed the fuel efficiency rate of the specified engine. Provide fuel curve showing fuel consumption (kWh/gallon) at 25%, 50%, 75% and 100% of prime rated capacity.
6. The substitute engine must be provided with a single jacket water cooling circuit without a separate aftercooler circuit.
7. The substitute engine must meet or exceed the heat rejection to the jacket water circuit of the specified engine.

G. Provide Newage/Stamford generators as indicated in the Specific Configuration requirements that follow or Kato equal, no other substitutes except as specifically noted below. The generator shall be rated for continuous output at the value and temperature rise indicated at 0.8 power factor. The generator shall be 2/3 pitch winding, 3 phase, 277/480 volt, 12 lead reconnectable, with PMG excitation.

H. If a Marathon or other generator of equivalent or greater capacity is provided it shall be modified and upgraded prior to installation. Upon receipt of the generator from the factory it shall be taken to a manufacturer’s authorized warranty service shop and the following tasks shall be performed:

1. Remove rotor assembly, bearing, exciter, diode plate and inspect for defects.
2. If any defects are encountered immediately file a warranty claim with the manufacturer.
3. Electrically test all windings.
4. Encapsulate exciter rotor winding with epoxy.

5. Replace bearing prior to reinstalling exciter. Bearing shall meet the minimum requirements of these specifications.
6. Replace diode plate mounting bolts with grade 8 bolts and use Loctite.
7. Insulate main rotor leads with phase paper. Secure leads with heat shrinkable polyester tape using epoxy on all knots.
8. Spray coat all windings with epoxy.
9. Dynamically balance and re-assemble.
10. Test at rated RPM.

2.2 SPECIFIC CONFIGURATION

Furnish Engine Generators of the capacity and configuration listed below:

No. 1: **Engine** - 260 hp, 180 ekW prime, John Deere 6081AFM75, Tier 2 Marine.
ECU Control Voltage = 12 VDC (standard).
Starting Voltage = 24 VDC (convert as required).
Generator - Minimum 185kW continuous at 105°C rise, Newage/Stamford UCI274H or Kato equal.

No. 2: **Engine** - 98 hp, 65 ekW prime, John Deere 4045TFM75, Tier 2 Marine.
ECU Control Voltage = 12 VDC (standard).
Starting Voltage = 24 VDC (convert as required).
Generator - Minimum 90kW continuous at 105°C rise, Newage/Stamford UCI274C or Kato equal.

2.3 ENGINE

A. Provide a skid mounted, 1800 RPM, diesel engine complete with generator/alternator and ready for service. Except where specific allowance is made in this specification for rebuilt or remanufactured engines, the unit shall be of newest design and of recent manufacture.

B. Marine engines shall be furnished without a charging alternator, heat exchanger, coolant expansion tank, or accessory reduction gear drive. Factory installed components shall be removed as required.

C. The engine shall be a four-cycle, water-cooled, direct injection diesel engine of 4 or 6 cylinder in-line configuration as indicated by model number and shall be provided with a gear driven coolant pump where offered by manufacturer.

D. Cylinder Liners: The engines shall be provided with removable cylinder liners to facilitate field rebuilding.

E. Horsepower: Certified engine power curves and fuel consumption at 25%, 50%, 75%, and 100% loading, shall be submitted showing the manufacturer's approval of the engine rating for engine generator prime power application. Special ratings or "continuous standby" ratings will not be acceptable.

F. Engine Control: All engine control functions will be performed by remote switchgear which will perform all start/stop, speed, paralleling, and load sharing control functions in addition to all engine function monitoring and safety shut

downs. Engine manufacturer's electronic control panels shall not be provided as part of this package.

G. ECU and Isochronous Governor: The engine speed shall be 1800 RPM over the entire load range. The frequency at any constant load, including no load, shall remain within +/- 0.5% isochronous control for rated frequency operation. Provide an Engine Control Unit (ECU) for interface with the switchgear.

H. Fuel: The engine shall be capable of satisfactory performance on No. 1 Arctic Grade Fuel or No. 2 Domestic Burner Oil.

I. Fuel System: The engine shall have manufacturer's engine mounted fuel filters with replaceable elements. Fuel supply and return lines shall be routed to the front of generator skid for field connection to the plant piping. See design drawings for detailed configuration.

J. Lubrication: The engine shall have a gear type lubricating oil pump for supplying oil under pressure to the main bearings, crankshaft bearings, pistons, piston pins, timing gears, camshaft bearings and valve rocker mechanism. Threaded spin-on type, full flow lubricating oil filters shall be provided. The oil drain line shall be terminated with a ball valve and bulkhead fitting through the skid on the side of the unit. See design drawings for detailed configuration.

K. Oil Level: The engine shall have a combination visual oil level site gauge with adjustable high and low level switches, Murphy L129CK1 or approved equal. Mount on rubber isolators and connect to engine with minimum #8 hoses. Carefully route upper vent hose to avoid any low point traps and connect directly into crankcase. Route lower hose to a connection directly on the oil pan. Do not tee lower hose into oil drain line. See design drawings for installation detail.

L. Fuel and Oil Hoses: All hoses for fuel, lube oil, vents, mechanical gauges, etc., shall be Aeroquip type FC300, Eaton Weatherhead H569 or approved equal. Minimum hose size shall be 5/16" (#6). Provide with re-useable JIC swivel type fittings. Push-on or barb type hose connections will not be allowed. Route hoses to avoid wear points and to ensure access to normal service points on the engine. Securely support hoses from engine and skid.

M. Glycol Hoses: All hoses for glycol shall be Teflon hose with stainless steel outer braid, Eaton Weatherhead H243 or approved equal. Provide with re-useable plated steel straight JIC swivel ends with NPT adapters. Route hoses to avoid wear points and to ensure access to normal service points on the engine. Securely support hoses from engine and skid.

N. Wire Loom: All wiring for control and instrumentation shall be routed in plastic loom. Provide tee fittings for all branch connections. Route loom to avoid wear points and to ensure access to normal service points on the engine. Securely support loom from engine and skid.

O. Protective Guards: All moving parts and hot surfaces shall be provided with protective guards in accordance with U.L Standard 2200.

P. Air Cleaners: The engine shall be provided with a dry-type, replaceable element air cleaner with a metal canister, Donaldson or approved equal. Open disposable

type air filters or plastic canisters will not be accepted. Provide visual air restriction indicator, 20" water column limit, manual reset, Donaldson X002251 or approved equal.

Q. Starting: The engine shall be equipped with a 24 VDC electric starting system. The starting system shall be of sufficient capacity to crank the engine at a speed which will allow full diesel starting. A starter auxiliary relay shall be remote mounted in control wiring junction box, Caterpillar 9X-8124 or approved equal.

R. Control Power: To provide 24VDC power to the control wiring junction box, a 30A circuit breaker with switch shall be mounted on the engine in the vicinity of the starter, Cooper 187-030-F-00 or approved equal.

S. Safety Controls: The automatic switchgear provided by others shall be equipped with automatic safety controls which will shut down the engine in the event of high jacket water temperature (primary), high lubricating oil temperature, low lubricating oil pressure, high or low lubricating oil level, high air filter restriction, and engine overspeed based on J1939 CANbus and engine mounted sensors. Note that a single low water shut down switch will be installed on the external cooling system.

2.4 EXHAUST FLEX

A. A flexible, continuous, 18 inch long stainless steel exhaust flex connector with welded connections shall be furnished for each engine, Alaska Rubber or approved equal. Provide an appropriate engine mating connection at one end and an ASA 125 lb. flange sized to match silencer at the opposite end as shown on the design drawings. Slotted cuff connections are not acceptable. Provide gasket, bolts, v-clamp, or any other components required for connection to the engine. Provide a 90° elbow where required for the flex to be installed vertically. Note that if the exhaust temperature sensor cannot be installed directly in the outlet connection, a 1/4" FPT stainless steel thread-o-let shall be welded into the flex between the engine connection and the corrugated hose.

2.5 ACCESSORIES

Provide the following accessories for each generating unit (unless otherwise indicated):

A. Caldyn spring vibration isolators complete with mounting hardware, four (4) per each unit, sized for the complete engine generator package weight.

B. Drip pan, 16-gauge galvanized sheet metal, liquid tight joints, 20" wide by 50" long by 1" high.

C. Provide two each minimum 800 cold crank amp 12-volt starting batteries, two for each engine. Batteries shall be sealed maintenance free, Optima Red Top NAPA Part Number BAT N993478RED or approved equal. Each battery shall be installed in a battery rack sized to securely hold the battery and shall include a minimum 5/8" plywood base.

D. Each engine shall be provided with two each #2/0 AWG arctic flex battery cables, length as required, plus one each #2/0 AWG by 12-inch long jumper. All cables shall include compression type terminal ends. One battery cable shall be red for

the positive lead and the other shall be black for the negative lead. The jumper shall be black with red heat shrink one end.

2.6 COOLING SYSTEM

A. Engine cooling shall be by remote radiators with coolant circulation driven by the engine coolant pump.

B. Glycol Filter: Provide screw-on canister style filter element with 3/8" NPT connections on head, Wix #24019 head with #24069 element. Mount head on steel bracket fixed to front or side of engine. Connect to engine with glycol hoses with 3/8" NPT quarter turn gauge cock isolation valves. Connect inlet to thermostat housing and connect outlet to water pump inlet. On thermostat housing connection provide 3/8" NPT tee fitting with plug for field connection of pre-heat line by others. When filters are provided as part of engine manufacturer's assembly the standard factory filters may be substituted for the above specified parts; however, equivalent mounting, connections, and isolation valves shall be included.

C. Provide one each low coolant level switches shipped loose, FW Murphy EL150K1 or approved equal.

D. On marine engines provide modifications as follows:

John Deere 4045TFM/AFM - Upon removal of coolant expansion tank and other accessories that are not required, install 2" diameter steel tube coolant line extensions to the front of the engine as required for 2" coolant hose connection.

2.7 INSTRUMENT PANEL

A. Provide a J1939 multi-function monitoring panel, Murphy PV101-C or approved equal. The panel shall be mounted on the side of the control wiring junction box. Provide with wiring harness as required for connection to ECU and battery power.

2.8 GENERATOR/ALTERNATOR

A. Generator shall be a single bearing, four pole, synchronous type. Generator shall be directly connected to the engine flywheel housing and driven through a flexible coupling to ensure permanent alignment. The generator shall be rated three phase, 277/480V, 60 Hz, 1800 RPM, brushless, 12 lead reconnectable, and winding pitch of 2/3 design. Windings shall be random wound and lashed at the end turns to provide superior mechanical strength.

B. The rotating assembly shall be dynamically balanced to less than 2 mils peak to peak displacement and shall be designed to have an over speed withstand of 125% of rated speed for 3 minutes when operating at stable rated operating temperature.

C. Cast iron end brackets with bearing bores machined for an O-Ring to retard bearing outer race rotation and fabricated steel frames shall be used. Bearings shall be pre-lubricated, double shielded, ball type, single row Conrad, C3 fit. Minimum B-10 bearing life shall be 30,000 hours for single bearing units.

D. Generator wiring diagram shall be permanently installed on the inside of the terminal enclosure cover.

E. The insulation system of both the rotor and stator shall be of NEMA Class H materials or better and shall be synthetic and non-hygroscopic. The stator winding shall be given multiple dips of resin, plus a final coating of epoxy for extra moisture and abrasion resistance. The rotor shall be layer wound with thermosetting 100% solids epoxy between each layer, plus a final coating of epoxy for moisture and abrasion resistance. The shaft exposed metal surfaces and rectifier assembly shall be coated with an epoxy varnish.

F. The generator shall be equipped with a permanent magnet generator (PMG) excitation system. Both the PMG and the rotating brushless exciter shall be mounted outboard of the bearing. The system shall supply a minimum short circuit support current of 300% of the rating for 10 seconds. The rotating exciter shall use a three-phase full wave rectifier assembly with hermetically sealed silicon diodes protected against abnormal transient conditions by a multi-plate selenium surge protector. The diodes shall be designed for safety factors of 5 times voltage and 3 times current.

G. Voltage Regulator: The voltage regulator shall be compatible with the PMG excitation and shall control the output of the brushless AC generator by regulating the current into the exciter field. The regulator shall include electromagnetic interference (EMI) filtering, and under frequency roll-off protection. Newage/Stamford MX-341, Caterpillar CDVR, Basler BE2000E, or approved equal.

1. The voltage regulator shall be factory mounted inside of the generator and shall be fully wired.
2. The voltage regulator shall be furnished complete with a cross current transformer (CT) for paralleling operation.

H. Nameplate: On the side of the generator housing, provide a nameplate that provides the following information. The nameplate shall be located in a clearly visible location and shall not be obscured by the terminal enclosure or located such that the nameplate is behind any part of the generator or housing.

1. Rated kW as specified.
2. Full load amps.
3. Rated voltage, phase, and power factor.
4. Rated voltage and current of the field exciter.

I. Each generator shall be provided with a standard sized terminal compartment. The terminal compartment shall be provided with a load connection block to allow easy field termination of the load, neutral, and ground conductors. The generator neutral connection shall not be connected to the mounting skid or the generator frame. The neutral shall be isolated for field grounding at the switchgear or transformer.

J. The generator shall be self-ventilated with a direct drive one-piece, cast aluminum alloy, unidirectional internal fan for high volume, low noise air delivery. Airflow shall be from opposite drive end through generator to drive end. The exciter shall be in the airflow.

2.9 MOUNTING SKID

A. The engine and generator shall be equipped with a suitable full length base frame (skid) for mounting the engine and generator. The skid shall be constructed from structural steel channel with ends beveled and plated for short term skidding and rolling of unit. **No formed or stamped steel base frame designs will be accepted.** Provisions shall be made so that the generator can slide back a minimum of 12" to access the rear main seal on the engine without removing the generator end off of the skid or requiring the use of blocking to support it. See the design drawings for skid design and layout.

B. Provisions shall be made in the skid for the mounting of vibration isolators at locations as indicated on the design drawings. Wedge washers shall be welded in place on the skid to provide a flat surface for the vibration isolator lock nuts.

C. Each engine generator shall be placed on the skid at the location indicated on the design drawings.

2.10 WIRING INTERFACE WITH REMOTE SWITCHGEAR

A. A control wiring junction box shall be furnished for each generator as follows:

1. The junction box shall be steel, NEMA 4, with hinged door and screw down latches. Hoffman or approved equal. See design drawings for size.

2. The junction box orientation, device layout, terminal block layout, and labeling shall be as indicated on the design drawings.

3. Install the instrument panel as previously specified in the junction box as shown on the design drawings.

4. All wiring for control, monitoring, and safety shall be terminated on terminal blocks within the control wiring junction. The terminals shall be IDEC or approved equal, BNH15LW except where indicated 50A provide BNH50W. Terminals shall be mounted on DIN rail with heavy duty end anchors. Each terminal block and all wire terminations shall be individually numbered as indicated.

5. The engine and generator mounted control wiring shall be provided with a maintenance loop of sufficient length to allow the generator to be slid back 12" minimum for maintenance of the engine without disconnecting any control wiring.

B. The DC power supply for the switchgear shall be provided from the engine starting batteries through the engine-mounted circuit breaker. Terminals shall be provided as indicated on the design drawings for supplying 24 VDC to the switchgear. The engine start systems shall be 24 VDC. The engine run systems shall be 12 VDC. All remote indication will be 24VDC, 4-20mA, or as otherwise indicated. All switches used for remote indication shall be rated for operation at 24 VDC.

2.11 PAINTING

Each unit shall be painted John Deere industrial tan including engine, skid, and generator.

2.12 SPARE FILTERS

In addition to the filters installed on the engines, provide the following quantities of replacement filters for each engine. Package spare filters in boxes and label each box with the community name.

A. Twelve (12) oil filters.

B. Four (4) fuel filters.

C. Three (3) air filters.

D. Four (4) glycol filters.

PART 3 - EXECUTION

3.1 FACTORY TESTS

A. Prior to shipment, the engine generator Fabricator shall perform factory tests on each unit at the shop where the engine generator is assembled. Provide certified copies of all Fabricators' test data and results. Supply sufficient notice to the Authority prior to performing tests. The Authority reserves the right to witness all tests. Test procedures shall conform to ASME, IEEE, and ANSI standards, and NEMA standard practices section on testing, as appropriate and applicable.

B. The Fabricator shall provide all required mechanical and electrical equipment including but not limited to fuel supply, radiator, and load bank.

C. The Fabricator shall provide all required measuring and indicating devices. All devices shall be certified correct or correction data furnished for the device.

D. Engine Tests: Shop test each engine generator with the associated control wiring junction box permanently connected. Perform customary commercial factory tests on each engine generator including, but not limited to, the following:

1. Perform hydrostatic test on water jackets to assure that water seals and water jackets are watertight. Test report shall indicate pressure at which test was made and the results.

2. Place engine in continuous operation without stoppage for a period of not less than eight hours. Operate not less than one hour at each load point (1/2, 3/4, and full load) and 1 hour at 110 percent of rated load. If stoppage becomes necessary during this period, repeat the 8-hour run. Also record the following data at the start, at 15-minute intervals, and at the end of each load run: Hz, kW load, fuel consumption, exhaust temperature, intake air temperature, jacket water temperature, lube oil temperature, lube oil pressure, manifold (boost) pressure, and crankcase vacuum.

E. Tests shall indicate satisfactory operation and attainment of guarantees and specified performance. Contractor shall not ship equipment without approval by the Authority of the shop test reports.

3.2 SHIPPING

A. After testing, and immediately prior to shutdown for shipping perform the following steps:

1. Operate the engine three to five minutes with oil, which has 3% to 4% VCI (volatile corrosion inhibitor) oil per engine crankcase volume. The oil does not have to be removed from the engine.

2. Remove any dirt from the air cleaner; check all seals and gaskets. Put lubricant on all points given in the lubrication chart of the engine operation guide.

3. Turn the engine at cranking speed with governor control in full off position and use a sprayer to add a mixture of 50% VCI oil and 50% 30 weight oil into the air intake or turbocharger inlet.

4. Continue spraying the mixture of 50% VCI oil and 50% 30-weight engine oil into the air intake or turbocharger inlet to ensure the cylinders and exhaust ports are coated with the oily mixture.

5. Clean the outside of the engine and inspect and ensure that the engine and generator are covered by good quality paint. Correct any deficiencies.

6. Spray a thin amount of 50% VCI oil and 50% 30-weight engine oil on the flywheel, ring gear teeth, and starter pinion. Install the covers to keep the vapors in.

7. Put a heavy layer of multipurpose grease on all outside parts that move, i.e. threaded rod, ball joints, linkage, etc.

8. Flush the cooling system with extended life 50/50 ethylene glycol mix, Shell Rotella ELC or approved equal. Install covers over the connections.

9. Install a positive mechanical seal consisting of a fitting plate and gasket on exhaust opening. Then install all covers and/or tape on openings, air intake, exhaust openings, flywheel housing, etc. Ensure all coves are air tight and weatherproof. Use waterproof, weather resistant type tape. Do not install tape in such a manner as will damage paint when the tape is removed. Install a mechanical protective device over any protruding items, which may be vulnerable to breakage during transportation.

B. After preparing the equipment for shipping, package each engine generator separately as follows:

1. Coil wiring harnesses and secure control wiring junction box to generator.

2. Put a waterproof cover over the entire engine generator unit. Make the cover tight, but loose enough to let air circulate around the unit to prevent damage to exposed metal parts from condensation.

3. All other included components (spare parts, loose items, etc.) shall be packaged individually in waterproof wrapping. Each individual component package shall then be packed in a box or crate, and each box/crate wrapped in waterproof wrapping to prevent corrosion to the components during extended periods of outside storage. All boxes or crates shall be palletized onto the minimum number of pallets, as required for the quantity and size of the boxes/crates.

END OF SECTION

SECTION 26 32 13.20
REBUILT DIESEL ENGINES

PART 1 - GENERAL

1.1 SCOPE

A. The Work included herein shall consist of furnishing diesel engines as specified herein.

B. The purpose of this solicitation is to procure used diesel engine(s), rebuilt to original equipment manufacturer (OEM) tolerances, durability, and quality. The diesel engine(s) will be used in a prime power, 1800 rpm, genset application. Rebuilt engines shall be delivered complete, tested, and ready for installation.

C. The Authority will not be furnishing cores. The Rebuilder shall furnish cores in compliance with Specification 26 32 13.10 Engine Generators, Paragraph 1.4, Regulatory Compliance.

D. The engines rebuilt in accordance with the requirements of 40 CFR 1068 and applicable NSPS standards.

1.2 RELATED REQUIREMENTS

A. Section 26 32 13.10 Engine Generators

1.3 SUBMITTALS

A. Provide in accordance with Division 1 requirements.

B. See Section 26 32 13.10 Engine Generators for additional requirements.

C. Provide the following a minimum of seven days prior to beginning final engine assembly:

1. An action plan specifying all work to be performed on existing engine components and a complete list of all new and remanufactured parts to be installed on each engine, with indication of new/remanufactured status.

2. All NDT inspection reports, existing component and original OEM dimensions and clearances, recorded by engine serial number for each engine. Note that if the contractor is furnishing OEM factory remanufactured engines the above information may not be available prior to final assembly. The information shall be provided as soon as available. If the results of the above inspections do not meet the requirements of these specifications for any engine that engine will be rejected.

1.4 REGULATORY COMPLIANCE

See Section 26 32 13.10 Engine Generators

1.5 QUALITY ASSURANCE

A. Engines shall not have been in service at any time after rebuilding and prior to delivery except as required to comply with Section 26 32 13.10 requirements for Factory Tests.

B. All new and refurbished parts, castings, assemblies and components furnished under these specifications shall meet original OEM specifications and be provided with contractor's warranty.

C. All work shall be performed by certified and experienced technicians trained and authorized to work on the engines being rebuilt and furnished.

D. All nondestructive testing (NDT) of castings and parts provided under these specifications to be performed to ASTM standards. All NDT inspections shall be performed by a Level II or Level III certified NDT inspector using a certified Quality System.

E. Where items are described as factory rebuilt or remanufactured, the term factory shall mean a machine shop that is regularly engaged in the practice of remanufacturing the type of items required.

1.6 REBUILDER QUALIFICATIONS

Engines shall be rebuilt by a qualified rebuilder (Rebuilder) who is regularly engaged in the business of rebuilding diesel engines.

A. The Rebuilder must have staff with extensive experience in rebuilding diesel engines. A list of five prior projects that key staff have worked on may be requested by the Authority after the bid opening and prior to award in order to verify Rebuilder qualifications. The list must include installation date, description of work, and a reference contact for each project.

B. The Rebuilder must have a fabrication facility with adequate space and appropriate equipment as required to perform the work. The Authority may inspect the Rebuilder's shop after the bid opening and prior to award in order to verify Rebuilder qualifications.

1.7 CONTRACTOR WARRANTIES –

See Section 26 32 13.10 Engine Generators for Warranty Requirements

1.8 OPERATION AND MAINTENANCE MANUALS

See Section 26 32 13.10 Engine Generators for Manual Requirements

PART 2 - PRODUCTS

2.1 ENGINE MANUFACTURER, MODEL, CONFIGURATION, AND MODEL YEAR

See Section 26 32 13.10 Engine Generators

2.2 ENGINE REBUILD STANDARDS AND PROCEDURES

A. Replacement Parts: These specifications require that some existing engine components be reconditioned and reused. Other components are required to be replaced with either new or factory remanufactured parts. For the remaining components, the Rebuilder may recondition the existing part, or replace it with either a new or factory remanufactured part. All parts and components, whether new, remanufactured, or reconditioned, shall meet or exceed original OEM specifications, tolerances, durability and quality. Refer to the specific components listed below in this section.

B. Disassembly & Cleaning: The used engine furnished for rebuilding shall be fully disassembled for cleaning, part inspection, qualification and reconditioning. All

cylinder liners, core plugs, passage plugs and other fittings shall be removed from all castings, including the cylinder block, cylinder head, oil cooler/filter housing, exhaust manifold, intake manifold, flywheel housing, front cover, etc., to enable complete and thorough cleaning. All bearings and bushings shall be removed. All castings and other parts to be inspected shall be cleaned in a caustic cleaning solution to remove all grease, oil, loose paint, surface corrosion, carbon deposits and any other foreign material. All oil passages shall be mechanically cleaned where possible and confirmed to be free of any obstructions. After cleaning, all parts subject to corrosion must be lightly oiled and wrapped.

C. Inspection and Measurement: After disassembly and cleaning, the following castings shall be visually and magnetic particle NDT inspected for defects: cylinder block external surfaces, cylinder block main bearing housing bore, cylinder head, crankshaft and camshaft (remove galley plugs, counterweights and gears), flywheel housing, timing gear cover, intake manifold and exhaust manifold. All components that are to be reused in engine assembly shall be inspected and measured to confirm tolerances are within OEM specifications.

D. Corrective Action Plan: After cleaning, inspecting, and measuring all engine components to be reused in the engine assembly, provide a corrective action plan, including a complete parts list with measured dimensions and OEM specified tolerances, for each engine serial number and submit to the Engineer for approval prior to proceeding with engine assembly. All engine components shall be upgraded to include the latest factory design improvements and shall be included in the corrective action plan.

E. Threaded Connections, Hardware and Fasteners: All threaded holes shall be inspected and tapped. Fasteners and hardware that are corroded, damaged, or do not meet original OEM specifications shall be replaced with new. All head bolts, flywheel bolts and any other torque-to-yield bolts shall be replaced with new. Any locking devices (such as lock washers and lock nuts) shall be replaced with new. During reassembly all fasteners shall be paint pen marked at the conclusion of final torque tightening.

F. Cylinder Block: After cleaning and inspection, the existing cylinder block shall be reconditioned.

1. The cylinder block shall be measured for deck height and deck surface flatness. The condition of all gasket and sealing faces as well as all O-ring lands and bolt holes shall also be inspected. All block surfaces shall be machined as necessary to meet OEM specifications. Furnish all new expansion plugs.

2. The cylinder block main bearing housing bore shall be checked for proper fit of caps to block, bore roundness, diameters and alignment. If fit, dimensions, and alignment meet OEM specifications, hone existing caps. If fit, dimensions and alignment meet do not meet OEM specifications, replace caps and perform line bore.

3. After resurfacing block, recut cylinder counter bores to proper dimensions. Note that upper and lower bore inserts are permitted as long as they meet or exceed factory repair procedures and factory new counter bore depth is maintained. Ensure that all cylinder parent bores meet OEM

specifications and check O-ring and crevice ring liner sealing areas for pitting prior to installing new cylinder liners.

4. If the reconditioned block does not meet all original OEM specifications, the block shall be replaced with a used block that that meets all original OEM specifications and has a manufacture date prior to Model Year 2014.

G. Crankshaft: The crankshaft shall be either reconditioned or replaced with a factory remanufactured crankshaft. Undersized journals and repair sleeves shall not be allowed. As a minimum, reconditioning shall include confirmation that dimensional, hardness, alignment, wear surface finish, and seal surface finish conditions meet OEM specifications. If the crankshaft has passed all other inspections, the journals shall be polished and checked with a surface profilometer to meet or exceed OEM smoothness requirements.

H. Connecting Rods: The connecting rods shall be reconditioned or replaced with new. If reconditioned only the castings shall be reused. After magnetic particle NDT inspection and checking for straightness, connecting rod big end shall be machined to OEM specifications using new bolts. Connecting rod small end shall receive a new bushing and be machined to OEM specifications.

I. Pistons, Rings, and Sleeves: The pistons, piston rings, and cylinder liners shall be new OEM parts. Aftermarket parts shall not be used.

J. Camshaft: The camshaft shall be either reconditioned or replaced with new. As a minimum reconditioning shall include confirmation that dimensional, hardness, alignment, wear surface finish, and seal surface finish conditions meet OEM specifications. If the camshaft has passed all other inspections, the lobes shall be ground to meet or exceed OEM specifications.

K. Rocker Arms and Push Rods: The rocker arms and push rods shall be new OEM parts. Aftermarket parts shall not be used.

L. Cylinder Head: The cylinder head shall be either reconditioned or replaced with a factory remanufactured complete assembly that meets or exceeds OEM specifications. If reconditioned, only the casting shall be reused with all parts replaced new. Welded, spray welded or otherwise repaired cylinder head castings shall not be allowed. Following are guidelines for reconditioning the existing cylinder head:

1. After inspection, the cylinder head shall be measured for surface flatness and resurfaced as necessary to meet OEM specifications. Ensure that no pitted or corroded areas remain outside of the gasket sealing area.

2. The overhead camshaft bores shall be measured for size and checked to ensure that roundness, taper, and alignment meet OEM specifications. Machining, line boring and straightening are acceptable practices for restoration of camshaft alignment. Fitting of replacement bearing shells, installing oversize components or performing metal build up are not acceptable practices for restoration of camshaft alignment.

3. All fuel injector sleeves, valves, seats, guides, springs, rotators and keepers shall be replaced new. Grind valves and seats to meet OEM specifications. After assembly, test valves and seats using a vacuum pump maintaining a minimum of 25in HG.

M. Electrical and Controls: Furnish a new or remanufactured ECU, flashed to the service and emissions certification specified under Section 26 32 12.10 Engine Generators, Paragraph 1.4, Regulatory Compliance. Furnish new engine sensors and new wiring harnesses. Furnish new or remanufactured starter.

N. Fuel System: Furnish new or remanufactured fuel injection pump, fuel transfer (lift) pump, injectors, and metering valves, Furnish new governor springs, filters, screens, gaskets, seals, O-rings, and fuel hoses. See Section 26 32 12.10 Engine Generators for hose type and installation. Inspect all metallic fuel tubing and replace with new if corroded, pitted, damaged, or otherwise not in compliance with OEM original specifications.

O. Lubrication System: Furnish new or remanufactured oil pump and pressure valve. Furnish new oil cooler, thermetic regulating valve, filters, screens, gaskets, seals, O-rings and hoses. See Section 26 32 12.10 Engine Generators for hose type and installation. Inspect all metallic lubrication tubing and replace with new if corroded, pitted, damaged, or otherwise do not meet OEM original specifications.

P. Cooling System: Furnish new or remanufactured water pump. Furnish new thermostat, filters, gaskets and hoses. See Section 26 32 12.10 Engine Generators for hose type and installation. Inspect all metallic coolant tubing and replace with new if corroded, pitted, damaged, or otherwise do not meet OEM original specifications.

Q. Air Intake and Exhaust Systems: The existing intake and exhaust manifolds shall be reconditioned and reinstalled if deemed suitable for reuse after NDT and visual inspections. If either casting is deemed unsuitable for reuse, replace with new OEM casting. Furnish a new or remanufactured turbocharger. Furnish all new gaskets, clamps and seals.

R. Painting: See Section 26 32 12.10 Engine Generators for painting

PART 3 - EXECUTION

3.1 FACTORY TESTS

See Section 26 32 13.10 Engine Generators for Testing Requirements

3.2 SHIPPING

See Section 26 32 13.10 Engine Generators for Shipping Requirements

END OF SECTION