Request for Proposal For:

Term Contract for 2024 Rural Power System M&I Switchgear Upgrade Projects
Project No. 25002

State of Alaska
Alaska Energy Authority
813 W Northern Lights Blvd, Anchorage, Alaska 99503

Advertising Date: October 1, 2024

This page is blank intentionally.

Note: Throughout this Request for Proposals (RFP) the terms Bid and Bidder are used in accordance with standard State of Alaska contracting forms. For the purposes of this RFP the term Bid is synonymous with Proposal and Bidder is synonymous with Proposer.

DIVISION 00 – BIDDING AND CONTRACT REQUIREMENTS

DIVISION 01 – GENERAL REQUIREMENTS

DIVISION 26 - TECHNICAL SPECIFICATIONS

DRAWINGS (Bound Separately)

END TABLE OF CONTENTS

ALASKA ENERGY AUTHORITY

REQUEST FOR PROPOSALS

for Construction Contract
competitive Sealed Proposals

Date **October 1, 2024**

Term Contract for 2024 M&I Switchgear Upgrade Projects, Project No. 25002

Location of Project: Statewide, Alaska
Contract Officer: Selwin C. Ray
Issuing Office: Alaska Energy Authority (Authority)

State Funded [ ] Federal Aid [x]

Description of Work: This Denali Commission and State appropriation funded contract is for a multi-year term contract to upgrade existing low-voltage paralleling switchgear in multiple rural Alaska communities. Base Bid work includes Nikolski, Ruby, Akiak, and St. George. Additive Alternate work includes Larsen Bay and Deering. The Contractor shall furnish all design, coordination, programming, labor, materials, supervision, equipment, tools, supplies, transportation, quality control, and testing required to complete the work as described in the specifications.

The initial Contract is for an estimated not to exceed cost between **$1,000,000.00 and $1,500,000.00** for a term of **Two Years.** It also includes up to **Three (3) each One-Year Optional Renewals** for additional projects in other communities. The contract renewal is to be exercised solely by the Authority and is subject to availability of funds and needs. Additional Projects will be assigned via Change Order. The Authority does not guaranty any minimum or maximum amount of projects. The Authority has the right to accomplish any work through means other than this agreement, including the use of in-house forces.

Proposers are invited to submit proposals consisting of a Price Proposal and a Technical Proposal. Proposals are due by **October 29, 2024** at **2:00 PM** local time where they will be opened publicly. The proposal opening will be conducted telephonically. Potential proposers may attend telephonically by calling **1-888-585-9008** and when prompted enter **351 122 943 #**.

SUBMISSION OF PROPOSALS

ALL PROPOSALS INCLUDING ANY AMENDMENTS OR WITHDRAWALS MUST BE RECEIVED PRIOR TO PROPOSAL OPENING. PROPOSALS SHALL BE SUBMITTED ON THE FORMS FURNISHED AND MUST BE MARKED AS FOLLOWS:

Proposal for Project: **Term Contract for 2024 M&I** **Switchgear Upgrade Projects** **Project No. 25002**	**ATTN: Selwin C. Ray, Contract Officer** **Alaska Energy Authority** **813 West Northern Lights Blvd.** **Anchorage, AK 99503**

Mailed proposals, amendments or withdrawals transmitted must be received in the above specified address no later than 4 hours prior to the scheduled time of proposal opening. **Hand-delivered proposals**, amendments or withdrawals must be received in the **Bid Drop Box in front of the Alaska Energy Authority**, prior to the scheduled time of proposal opening. **Emailed** proposal amendments or withdrawals must be received in the email inbox prior to the scheduled time of proposal opening, addressed to: Selwin C. Ray, Email: AEAProcurement@akenergyauthority.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 proposers 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 proposals and will not be discriminated against on the grounds of race, color, national origin, or sex in consideration for an award.

NOTICE TO PROPOSERS

Proposers are hereby notified that data to assist in preparing proposals is available as follows:

See attached Special Notice to Proposers 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) 771-3035

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

Justin Tuomi, Project Manager Phone: (907) 771-3093 Email: jtuomi@akenergyauthority.org

3
All questions relating to Proposing procedures should be directed to:

Selwin C. Ray
Contract Officer
813 West Northern Lights Blvd.
Anchorage, AK 99503
Phone: (907) 771-3055 Email: AEAProcurement@akenergyauthority.org

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

Reminder: 3 AAC 109.220 requires all Proposers to have a valid Alaska Business License and an Alaska Contractor's Certificate of Registration prior to award.

INFORMATION FOR PROPOSERS

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

PREPARATION OF BIDS

(a) Bids shall be submitted on the forms furnished, and must be manually signed in ink. 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 contemplated work.

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 FOR PROPOSERS

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

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."

Special Notice to Proposers

1. A non-mandatory pre-bid meeting is scheduled for **October 15, 2024**, **10:00 AM.** The pre-bid meeting will be conducted telephonically. Potential bidders may attend telephonically by calling **1-888-585-9008,** when prompted enter **351 122 943 #**. If calling in, please be respectful of other callers and call from a phone that can be muted so as to cancel out background noise and the possibility of feedback. Contact the Contract Officer, Selwin Ray, at (907) 771-3035 for more information. This is not a mandatory meeting, and there will not be a scheduled site visit prior to the bid opening.

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)**

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)**
6. **Certificate of Insurance** (from carrier)

FEDERAL EEO BID CONDITIONS

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246). FOR ALL NON-EXEMPT FEDERAL AND FEDERALLY-ASSISTED CONSTRUCTION CONTRACTS TO BE AWARDED IN THE STATE OF ALASKA

1. Definitions. As used in these specifications:

   a. "**Covered area**" means the geographical area described in the solicitation from which this contract resulted;

   b. "**Director**" means Director, Office of Federal Contract Compliance Programs (OFCCP), United States Department of Labor (DOL), or any persons to whom the Director delegates authority;

   c. "**Employer**" identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

   d. "**Minority**" includes:

      (1) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);

      (2) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race);

      (3) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and

      (4) American Indian or Alaska Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the DOL in the covered area, either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades that have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or subcontractor's failure to make good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7(a) through 7(p) of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

Covered construction contractors performing construction work in geographical areas where they do not have a federal or federally-assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any OFCCP office or from federal procurement contracting officers.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period of an approved training program and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

   a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligations to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

   b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

   c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

   d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

   e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the DOL. The Contractor shall provide notice of these programs to the sources compiled under 7(b) above.

   f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendent, general foreman, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and dispositions of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-used toilet, necessary changing facilities and necessary sleeping facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontractors from minority and female construction contractors and suppliers, including circulations of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations 7(a) through 7(p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any or more of its obligations under 7(a) through 7(p) of these specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female work force participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.)

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any subcontract with any person or firm debarred from government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the OFCCP. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunities. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic apprentice, trainees, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that the existing records satisfy this requirement, Contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws that establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Programs).

16. The Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

17. The Contractor shall provide written notification to the Department, for all subcontracts documents as follows: the name, address and telephone number of subcontractors and their employer identification number; the estimated dollar amount of the subcontracts; estimated starting and completion dates of the subcontracts; and the geographical area in which the contract is to be performed.

    This written notification shall be required for all construction subcontracts in excess of $10,000 at any tier for construction work under the contract resulting from this project's solicitation.

18. As used in the Bid Notice, and in the contract resulting from this project's solicitation, the "covered area" is the State of Alaska.

PROPOSAL EVALUATION PROCEDURE

Competitive sealed proposals will be evaluated by a committee (3 AAC 109.370). Scoring of proposals will be accomplished as follows:

1.1 Each Evaluator will individually read and rate Proposer's response to each criterion, except for Price Proposal, as described under Evaluation Criteria Section 00 23 00. Ratings will be based solely on contents of proposals. Except as may be stated within any criterion description, a rating of "5" indicates the most responsive; ratings of "4-1" indicate progressively less responsiveness; and a rating of "0" indicates Non-responsive. Tie scores are permissible for evaluation criteria addressing schedule. Ratings are multiplied by the assigned weights for each criterion to obtain criterion scores.

1.2 After completion of individual ratings, the Evaluation Committee will meet to discuss proposals. Evaluators may then alter their ratings; however, any changes shall be based solely on the Evaluation Criteria set forth in the RFP. Additional criteria may not be considered.

1.3 During the Evaluation Committee Meeting, Evaluators may discuss factual knowledge of, and may investigate Proposers' and proposed Subcontractors' prior work experience and performance, including projects referenced in proposal, available written evaluations, etcetera, and may contact listed references or other persons knowledgeable of a Contractor's and/or a Subcontractor's past performance. Factors such as overall experience relative to the proposed contract, quality of work, and ability to meet schedules may be addressed. If any issues of significant concern to the proposed contract are discovered, the Committee may:

a. Provide written recommendations to the Contracting Officer for consideration prior to contract award;

b. Recommend suspension of the Proposer from consideration for award of the contract if there is probable cause for debarment (3 AAC 109.610); or

c. Conduct discussions in accordance with paragraph 1.4, below.

1.4 The Committee may decide to conduct discussions (or "interviews") with responsible Proposers whose proposals are determined to be reasonably susceptible of being selected for award for the purpose of clarification to assure full understanding of, and responsiveness to, the solicitation requirements. After discussions, Evaluators will determine the final scoring and ranking for award by evaluating written and oral responses using only the Evaluation Criteria set forth in the RFP. Additional criteria may not be considered.

1.5 The Contracting Agency will then open the Price Proposals and calculate scores for price in accordance with Section 00 23 00.

1.6 All Proposers will be advised of the Proposer selected for award after completion of the evaluation process. A Notice of Intent to Award will be provided to all Offerors. TECHNICAL AND PRICE PROPOSALS WILL NOT BE DISCLOSED TO THE PUBLIC OR TO COMPETING OFFERORS UNTIL AFTER A NOTICE OF INTENT TO AWARD IS ISSUED.

NOTICES

1. The Contracting Agency is an equal opportunity employer.
2. Copies of the Contract General Conditions are attached.
3. Offerors are specifically advised that a contract shall not be in effect until a written agreement is executed by an authorized agent of the Authority. The Authority shall not be liable for any cost incurred by an Offeror in response to this solicitation, including any work done, even in good faith, prior to execution of a contract and issuance of a Notice to Proceed.
4. The Authority expressly reserves the right to waive minor informalities, negotiate changes or reject any and all proposals and to not award the proposed contract, if in its best interest. "Minor Informalities" means matters of form rather than substance which are evident from the submittal, or are insignificant matters that have a negligible effect on price, quantity, quality, delivery, or contractual conditions and can be waived or corrected without prejudice to other Offerors.
5. All proposals shall be open for public inspection per (3 AAC 109.680) after a Notice of Intent to Award is issued. Offerors should not include proprietary information in proposals if such information should not be disclosed to the public. Any language within a submittal purporting to render all or portions of a proposal confidential will be disregarded. Proprietary information which may be provided after selection for contract negotiations will be confidential if expressly agreed to by the Authority and Executive Director.
6. Substitution for any personnel named in a proposal may result in termination of negotiations and the contract, if substitutions are not approved the Authority.
7. If it is discovered that a selected Offeror is in arrears on taxes due the State of Alaska, a contract may not be awarded until the Alaska Department of Revenue approves the payment provisions for the contract.
8. Offerors and proposed subcontractors shall be in compliance with the statutory requirements for Alaska business licensing and professional registrations included in the certification statement on Page 2 of Part D in this RFP package.

END OF SECTION

SUBMITTAL CHECKLIST

Competitive Sealed Proposals

Term Contract for 2024 M&I Switchgear Upgrade Projects **Project No.: 25002**

EXAMINATION OF RFP

[ ] 1. Proposers are expected to examine carefully the RFP Documents before submitting a proposal. The submission of a proposal shall be considered prima facie evidence that the Proposer has made such examination and is satisfied as to the conditions to be encountered in performing the work and as to the requirements of the Contract Documents.

PREPARATION OF PROPOSALS

[ ] 2. Proposers must carefully review the RFP Documents for defects and questionable material and become familiar with submittal requirements before preparing proposals. Any explanation desired by Proposers regarding the meaning or interpretation of any of the project documents provided by the Contracting Agency must be requested in writing as indicated in the Request for Proposals (Document 00 02 00). Substantive issues will be addressed in an addendum to all recipients on record as receiving the RFP Documents. Oral explanations or instructions given before the award of the contract will not be binding. Failure to comply with directions will result in a lower score and may eliminate a submittal from consideration. ***Protests based upon any omission, error or content of this solicitation may be disallowed at the discretion of the contracting agency if the protest is not received in writing at least ten calendar days prior to the submittal deadline 3 AAC 109.570.***

[ ] 3. Review all parts of the RFP Documents, and then focus on the following documents: RFP, this Submittal Checklist, Evaluation Criteria, and the Proposal Forms.

[ ] 4. Review the Evaluation Criteria. Read the criteria in each section in light of the proposed project as portrayed in the RFP Documents. Be aware of the assigned weight for each criterion. Plan your proposal to address the applicable criteria. All criteria Responses shall not exceed the number of pages stated below.

[ ] 5. Prepare a distinct Response for each criterion. Failure to respond directly to any criteria will result in an evaluation score of zero for that criterion. Acceptable responses must be specific and directly related to the proposed project. Marketing brochures and photographs, federal standard forms 330s, marketing resumes, and other non-project specific materials will be discarded without evaluation and should not be submitted.

[ ] 6. ***Each criterion Response must be titled, numbered and assembled in the order in which the criteria are listed in Section 00 23 00***, so the criterion to which information applies shall be plainly evident. Material not so identified or assembled may be discarded without evaluation. Responses shall be presented on 8 ½" X 11" paper, except for a minimal number of larger sheets (e.g. 11"x17") that may be used for drawings & schedules if they are folded to 8½ " x 11" size. Larger sheets will be counted as one page in the page count. **CAUTION:** small print or typeface that is difficult to read will negatively influence evaluation of your submittal.

[ ] 7. Complete all entries on the Price Proposal Form (Section 00 31 00) and Technical Proposal (Section 00 33 00). Note the statutory requirements for Alaska Licenses and be sure to sign and date the Certification.

[ ] 8. Attach criteria Responses (**EXCEPT** PRICE PROPOSAL) to the Technical Proposal (Section 00 33 00). The maximum number of attached pages (each printed side equals one page) for criteria Responses shall not exceed: **10 pages**.

Page limit applies solely to the attachments to the Technical Proposal form. ***CAUTION****: Criteria Responses which exceed the maximum page limit or otherwise do not meet requirements stated herein, may result in disqualification.*

PRICE PROPOSAL

[ ] 9. Review the Price Proposal, Bid Schedule, and Bid Bond documents. Prepare a Price Proposal for all labor, materials, equipment, and services necessary to complete the Work in the RFP Documents. Complete the three documents on the forms furnished, or copies thereof.

[ ] 9.1 The Bid Schedule will provide for quotation of a price or prices for one or more contract 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 proposed price for the work

[ ] 9.2 Where required, Proposers 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, Proposers should insert the words "no bid" in the space provided for any item not requiring a quotation and for which no quotation is made.

[ ] 9.3 On unit price contracts Proposers 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.

[ ] 9.4 All entries made by Proposers and designating applicable preferences must conform to the requirements of 3 AAC 109 and the instructions on the forms to warrant consideration.

[ ] 9.5 Neither conditional nor alternative bids will be considered unless called for.

[ ] 9.6 Unless specifically called for, telegraphic or telefacsimile bids will not be considered.

[ ] 9.7 The Proposal forms must be signed with ink. If the Proposer is a corporation, the proposal shall be signed by an individual having authority to sign the contract. If the Proposer is a partnership, the proposal shall be signed by any authorized member of the partnership. If the Proposer is a sole proprietorship, the proposal shall be signed by the owner. Any erasure or change on the forms must be initialed by the person signing the proposal.

ACKNOWLEDGEMENT OF ADDENDA

[ ] 10. The Price Proposal and Technical Proposal forms provide for acknowledgement individually of all Addenda to the RFP Documents. All addenda shall be acknowledged on these forms or by written revision prior to the scheduled time for submittal of proposals. If no addenda are received, the word "None" should be shown as specified.

REQUIRED DOCUMENTS

[ ] 11. Submittals shall consist of the following applicable items assembled as follows and in the order listed. Proposals will not be considered if documents are not completely filled out. Electronic submittals are NOT acceptable.

[ ] 11.1 Five (5) copies of Technical Proposal Form Section 00 33 00 (at least one copy with original signature) with attached responses to all Evaluation Criteria [**EXCEPT PRICE PROPOSAL**] . Each copy shall be fastened with one staple in the upper left corner. No other form of binding shall be used and no cover and no transmittal letter other than the Technical Proposal form will be included. CAUTION: Failure to comply with this instruction will negatively influence evaluation of Submittal.

[ ] 11.2 **One copy** of the Price Proposal (Section 00 31 00), with the Bid Schedule (Section 00 32 00, and Bid Bond (Section 00 41 00) attached, with one staple in the upper left corner. The Price Proposal, Bid Schedule and Bid Bond shall be enclosed together in a separate sealed envelope marked on the outside to identify it as **PRICE PROPOSAL** and with the names of the Project and Proposer.

DO NOT place your Technical Proposal Form (Section 00 33 00) in the sealed price proposal envelope.

[ ] 11.3 **CAUTION:** If you replicate (other than by photocopy) any form in the RFP in lieu of filling out forms provided by the Contracting Agency, provide a signed certification that lists such forms and attests that they are exact replicas of that issued by the Contracting Agency. Changed forms may result in rejection at the Contracting Agency's discretion. Any alteration may be cause for rejection without recourse.

DELIVERY

[ ] 12. Deliver **submittals in one sealed package** to the location and before the submittal deadline cited in the Request for Proposals (Section 00 02 00). Do not include in the package any proposals or bids for other projects. **Mark the outside of the package** to identify the Project and the Proposer in accordance with the Request for Proposals (Section 00 02 00). Proposals must be received prior to the specified date and time. Late proposals will not be opened (3 AAC 109.360).

WITHDRAWAL OR REVISION OF PROPOSALS

[ ] 13. A Proposer may withdraw or revise a proposal after it has been delivered to the Contracting Agency, provided that the request for such withdrawal or revision is received by the designated office, in writing.

END OF SECTION

EVALUATION CRITERIA

Competitive Sealed Proposals

Term Contract for 2024 M&I Switchgear Upgrade Project **Project No. 25002**

1. Project Understanding and Methodology

1. Weight: 10

Response must **demonstrate your comprehension of the project objectives, requirements and services**. Identify any pertinent issues and potential problems related to the project. Describe the proposed methodologies to overcome potential problems to achieve project success and to ensure the utilities do not experience excessive power outages during upgrades. Response must demonstrate offeror's approaches to account for unique conditions of the facility.

Response must outline the methods for accomplishing the proposed contract. Describe what, when, where, how, and in what sequence the work will be done. Present generator controls philosophy. Identify the amount and type of work to be performed by any subcontractors. Consider how each task may be carried out and what services or interaction will be required from/with the Contracting Agency.

2. Project Management Plan

2. Weight: 10

Response must describe the administrative and operational structures that will be used for performing the proposed contract. For example consider: who will have overall responsibility for the contract? What will the lines of authority be? Describe how communications will be maintained between your Project Staff and the Contracting Agency. Explain how your team will be completely accountable.

Describe the work to be performed by the individuals you name to perform essential functions, including subcontractors, and detail their specific area(s) of responsibility**.** A response prepared specifically for this proposal is required, as marketing resumes often include non-relevant information which may detract from the evaluation of proposal. Focus on individual's specific duties and responsibilities and how project experience is relevant to the proposed contract.

3. Experience and Qualifications

3. Weight: 20

Response must describe the relevant qualifications and experience of the prime contractor (offeror) and major subcontractors. Identify any distinct and substantive qualifications for undertaking the proposed contract such as the availability of specialized equipment or unique approaches or concepts relevant to the required services which the firms may use. Include experience on similar projects and dates of construction. Describe the relevant qualifications and experience of key employees (of prime and subcontractors) who will actually perform the work. Describe the work to be performed by the individuals you name and detail specific qualifications and substantive experience directly related to the proposed contract, years of experience and jobs completed with similar size and scope. A response prepared specifically for this proposal is required. Resumes including non-relevant information may detract from the evaluation of your proposal. Focus on individual's specific duties and responsibilities and how project experience is relevant to the proposed contract.

For each person named, identify: employer, job classification, and state of residency. List at least 3 references (contact persons and telephone numbers) for each person.

If the team is composed of a prime and subcontractors, discuss any prior work relationships among the firms - in particular, regarding projects similar to this project. Discuss each firm's particular responsibilities for prior contracts that were similar to the work described in the RFP. Indicate which of the firms were involved in such contracts. For each contract, list the contracting entity and a reference (contact person and a telephone number).

4. Schedule

4. Weight: 10

The Authority desires to complete all of the Base Bid projects no later than December 15, 2025. Response must provide a proposed schedule with dates for the following milestones:

- Initial Submittals for First Project
- Completion of Field Installation for First Project
- Completion of Field Installation for Second Project
- Completion of Field Installation for Third Project
- Completion of Field Installation for Fourth Project

Describe any anticipated concerns with meeting the schedule including availability of specified equipment.

PRICE EVALUATION

5. Price Proposal

7. Weight: 50

Provide a Price Proposal (as instructed by the Submittal Checklist) for all labor, subcontracts, equipment, expenses, etc., in compliance with the RFP. Submit a completed Price Proposal (Section 00 31 00), the Bid Schedule (Section 00 32 00) and Bid Bond (Section 00 41 00).

The Price Proposal score will be calculated as follows:

$$\text{Criterion Score} = \frac{\text{(Price of Lowest Cost Proposal) X MPP}}{\text{Price of Offeror's Proposal}}$$

Wherein: For purpose of scoring, the **Proposal Price** will be the Total Base Bid Amount as stated on the Bid Schedule, and:

The **MPP** (Maximum Possible Points) will equal (5) x (# of Evaluators) x (Weight assigned to Criterion).

END OF SECTION

ALASKA ENERGY AUTHORITY

PRICE PROPOSAL

of

NAME _____

ADDRESS _____

_____

To the CONTRACTING OFFICER, ALASKA ENERGY AUTHORITY:

In compliance with your Request for Proposal dated **October 1, 2024**, 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

Term Contract for 2024 M&I Switchgear Upgrade Projects
Project No. 25002

Located at Statewide, 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 Proposal.

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

The Undersigned hereby agrees to execute the said contract and bonds within fifteen calendar days, or such further time as may be allowed in writing by the Contracting Officer, after receiving notification of the acceptance of this 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 of the effective date of Notice to Proceed and to Substantially Complete the work by the **date(s) indicated in Section 01 11 13 - Summary of Work** 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

Term Contract for 2024 M&I Switchgear Upgrade Projects
Project No. 25002

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 on 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. In case of error in the extension of prices in the bid, the unit prices will govern.

Contract award shall be made based on the Total Base Bid. AEA reserves the right to award none or any number of alternates in any order in the best interest of the State.

Bidders are required to bid on all bid items. Conditioned or qualified bids will be considered non-responsive.

Bid Item	Description	Lump Sum Price
1	Nikolski Switchgear Upgrade	$
2	Ruby Switchgear Upgrade	$
3	Akiak Switchgear Upgrade	$
4	Saint George Switchgear Upgrade	$
	Total Base Bid	$
A1	Additive Alt. #1 Larsen Bay Hydro Switchgear Upgrade	$
A2	Additive Alt. #2 Larsen Bay Diesel Switchgear Upgrade	$
A3	Additive Alternate #3 Deering Switchgear Upgrade	$

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

2. Acknowledge all addenda

Addendum No	Date Issued	Addendum No	Date Issued	Addendum No	Date Issued

3. BIDDER'S NOTICE: By signature on this form, the Bidder certifies that:

a. The price(s) submitted are independent and without collusion.

b. The Bidder will comply with the laws of the State of Alaska;

c. The Bidder will comply with applicable portions of the Federal Civil Rights Act of 1964;

d. The Bidder will comply with the Equal Employment Opportunity Act and the regulations issued there under by the State and Federal Government; and

e. The Bidder has reviewed all terms and conditions in this Invitation to Bid.

If any Bidder fails to comply with any of these requirements, the Authority may reject its bid, terminate the contract, or consider the Vendor in default.

Company Submitting Bid	**Telephone Number**
Address	**Fax Number**
Authorized Signature	**E-mail Address**
Print Name	**Alaska Business License number:** **_____ EXPRES DATE:_____**
	Alaska Contractor's Registration # **_____ EXPRES DATE:_____**

End of Bid Schedule.

ALASKA ENERGY AUTHORITY

TECHNICAL PROPOSAL

of

NAME _____

ADDRESS _____

_____

To the CONTRACTING OFFICER, ALASKA ENERGY AUTHORITY:

In compliance with your Request for Proposal dated **October 1, 2024**, 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

Term Contract for 2024 M&I Switchgear Upgrade Projects
Project No. 25002

Located at Statewide, Alaska, according to the plans and specifications.

The Undersigned understands that a Proposal Evaluation Committee will evaluate all of the Proposals received and select for contract award the proposal which represents the best value to the Alaska Energy Authority. The Undersigned offers for consideration the attached narrative proposal consisting of not more than **Ten** single-sided pages. The narrative addresses each of the evaluation criteria described in Section 00 23 00.

The Undersigned understands that the contract is intended to be awarded to the Proposer with the highest point score considering all of the evaluation criteria described in Section 00 23 00.

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

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

ALASKA ENERGY AUTHORITY

BID BOND

For

Term Contract for 2024 M&I Switchgear Upgrade Projects
Project No. 25002

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

Term Contract for 2024 M&I Switchgear Upgrade Projects
Project No. 25002

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

Term Contract for 2024 M&I Switchgear Upgrade Projects
Project No. 25002

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

Term Contract for 2024 M&I Switchgear Upgrade Projects
Project No. 25002

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,

Substantially Completed by**: Date indicated in Section 01 11 13 - Summary of Work**
Final Completion**: Date indicated in Section 01 11 13 - Summary of Work**

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

Term Contract for 2024 M&I Switchgear Upgrade Projects
Project No. 25002

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

Term Contract for 2024 M&I Switchgear Upgrade Projects
Project No. 25002

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

Term Contract for 2024 M&I Switchgear Upgrade Projects
Project No. 25002

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.l 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 AUTHORITY 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:

10.4.1 Payroll costs for employees in the direct employ of the CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by the 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."

This page is blank intentionally.

SECTION 00 80 00
SUPPLEMENTARY CONDITIONS

MODIFICATIONS TO THE GENERAL CONDITIONS 00 70 00

The following supplements modify, change, delete from, or add to Section 00 70 00 "General Conditions", 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.

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 construction 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:

"The submission of a bid by the CONTRACTOR is considered a representation that the CONTRACTOR is satisfied as to the conditions to be encountered in performing the Work and as to the requirements of the Contract Documents.**"**

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-4.7 – SURVEY CONTROL

At General Conditions Article 4.7, delete the section in its entirety.

SC-5.4.3 – INSURANCE REQUIREMENTS

At General Condition Article 5.4.3 add the following:

"d. 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."

SC-5.4.2 b- COMMERCIAL GENERAL LIABILITY INSURANCE

At General Conditions Article 5.4.2.b, remove and replace the last sentence with the following:

"The following parties shall be named as "Additional Insured" under all liability coverages listed

above:

The Authority
The Denali Commission

SC-5.4.2d- BUILDER'S RISK INSURANCE

At General Conditions Article 5.4.2.d, delete the subsection in its entirety.

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 as 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 AUTHORITY.

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 be 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 0 percent of the value of the subcontract at issue.

SC-7.14 – WAGES AND HOURS OF LABOR

General Condition Article 7.14.1 (Certified Payroll) and Article 7.14.3 (D.O.L. Notification) shall apply to all on-site construction work in the communities.

General Condition Article 7.14.2 (Alaska Little-Davis-Bacon Wage Rates) shall apply to all on-site construction work in the communities. Applicable wage rates can be obtained at:
https://labor.alaska.gov/lss/pamp600.htm

SC-9.4–CHANGE ORDER

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-11.3 – COMPUTATION OF CONTRACT TIME

At General Conditions Article 11.3.3, delete the subsection in its entirety.

SC – 11.5 – EXTENSION DUE TO DELAYS:

At General Conditions Article 11.5, delete paragraph in its entirety and replace with the following:

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, acts or restraints of governmental authorities affecting the project or directly or indirectly prohibiting or restricting the furnishing or use of materials or labor required; inability to secure materials, machinery, equipment or labor because of priority, allocation or other regulations of any governmental authorities, 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.

SC-11.8–DELAY DAMAGES

At General Condition Article 11.8, delete the subsection in its entirety.

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 – 13.5 – STORED MATERIALS AND EQUIPMENT

At General Conditions Article 13.5, add the following:

> "No payment will be made for an individual/unique item of material or equipment with a total value less than $25,000 per item or for any item of material or equipment scheduled for incorporation into the work in less than 60 days from its arrival on site."

SC – 13.10 – SUBSTANTIAL COMPLETION

At General Conditions Article 13.10, add the following paragraph:

> "As there are multiple communities considered in this contract, and will require separate inspections for each community, the CONTRACTOR shall notify the AUTHORITY of Substantial Completion in each community individually."

SC – 13.12 – FINAL INSPECTION

At General Conditions Article 13.12, replace entire subsection with the following paragraphs:

> "Each Substantial Complete Inspection shall also serve as the Final Inspection. If additional inspections after the Substantial Completion Inspection are required by the Authority in any of the considered communities The CONTRACTOR shall pay for all costs incurred by the AUTHORITY.
>
> Upon written notice from the CONTRACTOR that the remaining Work or an agreed portion thereof is complete, the Project Manager may 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 additional re-inspections."

SC – 13.13 – FINAL COMPLETION AND APPLICATION FOR PAYMENT

At General Conditions Article 13.13, add the following paragraph:

> "As there are multiple communities considered in this contract, the CONTRACTOR shall itemize Final Payment for each community."

MODIFICATIONS TO THE FEDERAL ASSURANCES 00 90 00

The following supplements modify, change, delete from, or add to Section 00 90 00 "Federal Assurances". Where any Paragraph, Subparagraph, or Clause of the Federal Assurances is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Paragraph, Subparagraph, or Clause shall remain in effect.

SC-90.1–BREACHES AND DISPUTE RESOLUTION

At Federal Assurances Paragraph 90.1 delete the paragraph in its entirety. See General Conditions 00 70 00 Article 15 for Claims and Disputes

SC-90.2 – TERMINATION

At Federal Assurances Paragraph 90.2 delete the paragraph in its entirety. See General Conditions 00 70 00 Article 14 for Suspension of Work and Termination.

SC-90.4–DAVIS-BACON ACT, AS AMENDED

At Federal Assurances Paragraph 90.4 delete the paragraph in its entirety. See Supplemental Conditions 00 80 00 SC-7.14 for prevailing wage rate requirements.

SC-90.13–DOMESTIC PREFERENCES FOR PROCUREMENTS

The Denali Commission Federal funds are exempt from the Buy America Act and therefore this project is not subject to the Buy America Act.

END OF SECTION

ALASKA ENERGY AUTHORITY
SECTION 00 90 00
FEDERAL ASSURANCES

Because this contract is funded with federal funds, the following contract provisions shall apply, where applicable, to all work performed on the contract by the contractor's own organization and by subcontractors. As provided in this 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 subcontracts or purchase orders that may in turn be made. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with all applicable Required Contract Provisions.

90.1 BREACHES AND DISPUTE RESOLUTION.

Contracts in excess of $250,000. Any dispute arising under this Contract which is not disposed of by mutual agreement shall be resolved in accordance with 2 AAC 108.915.

90.2 TERMINATION.

Contracts in excess of $10,000. This Contract may be terminated by either party upon 10 days written notice if the other party fails substantially to perform in accordance with its terms through no fault of the party initiating the termination ("Default Termination"). If the Authority terminates this agreement, the Authority will pay the Contractor a sum equal to the percentage of Work completed that can be substantiated either by the Contractor to the satisfaction of the Authority, or by the Authority. If the Authority becomes aware of any non-conformance with the Work or this agreement by the Contractor, the Authority will promptly notify the Contractor in writing of the non-conformance. Should the Contractor's Work remain in non-conformance after having received written notification, the percentage of total compensation attributable to the non-conforming Work may be withheld. The Authority may at any time suspend or terminate ("Convenience Termination") this Agreement for its needs or convenience with or without cause upon written notice. In the event of a Convenience Termination, the Contractor will be compensated for all authorized Work and authorized expenditures performed to the date of receipt of written notice of termination plus reasonable expenses. No fee or other compensation will be due for any incomplete portion of the Work.

90.3 EQUAL EMPLOYMENT OPPORTUNITY.

Except as otherwise provided under 41 CFR Part 60, **all construction contracts** must include, and all contractors and subcontractors must comply with, the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, "Equal Employment Opportunity" (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and implementing regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."

90.4 DAVIS-BACON ACT, AS AMENDED (40 U.S.C. 3141-3148).

Construction contracts in excess of $2,000 are required to comply with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must

pay wages not less than once a week. **A copy of the current prevailing wage determination issued by the Department of Labor is included in this solicitation.** Contract and subcontract awards must be conditioned upon the acceptance of the wage determination. All suspected or reported violations must be reported to the Federal awarding agency.

90.5 COPELAND "ANTI-KICKBACK" ACT (40 U.S.C. 3145)

Construction contracts in excess of $2,000 are required to comply with the **Copeland "Anti-Kickback" Act** (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"). Each contractor or subrecipient is prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. All suspected or reported violations must be reported to the Federal awarding agency.

90.6 CONTRACT WORK HOURS/SAFETY STANDARDS ACT (40 U.S.C. 3701-3708).

Construction contracts in excess of $100,000 that involve the employment of mechanics or laborers are required to comply with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor is required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

90.7 RIGHTS TO INVENTIONS MADE UNDER A CONTRACT OR AGREEMENT.

If the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or subrecipient must comply with the requirements of 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

90.8 CLEAN AIR ACT (42 U.S.C. 7401-7671Q.) AND THE FEDERAL WATER POLLUTION CONTROL ACT (33 U.S.C. 1251-1387), AS AMENDED

Contracts in excess of $150,000 are required to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

90.9 DEBARMENT AND SUSPENSION (EXECUTIVE ORDERS 12549 & 12689)

A contract award **greater than or equal to $25,000** (see 2 CFR 180.220) must not be made to parties listed on the government wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension." **Contractors that**

apply or bid for an award exceeding $25,000 must sign and submit the attached "Debarment" certification with their bid.

90.10 BYRD ANTI-LOBBYING AMENDMENT (31 U.S.C. 1352)

Each contractor and subcontractor must certify that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Disclosures shall be forwarded from tier to tier up to the Authority. **Contractors that apply or bid for an award exceeding $100,000 must sign and submit the attached "Lobbying" certification with their bid**.

90.11 PROCUREMENT OF RECOVERED MATERIALS.

A state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, **where the purchase price of the item exceeds $10,000 or the value of the quantity acquired during the preceding fiscal year exceeded $10,000;** procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

90.12 PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT.

Contractors and subcontractors are prohibited from entering into a contract (or extending or renewing a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115-232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities). See § 200.216.

90.13 DOMESTIC PREFERENCES FOR PROCUREMENTS.

As appropriate and to the extent consistent with law, and to the greatest extent practicable, Contractor's are required to provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all contracts and purchase orders for work or products under this award. See § 200.322.

DEBARMENT, SUSPENSION, INELIGIBILITY & VOLUNTARY EXCLUSION – 2 CFR 200.214; Executive Orders 12549 and 12689 [Applicable to all federally assisted contracts which exceed $25,000]

Instructions for Certification:

1. 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 contractor and lower tier participants knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the Authority may pursue available remedies, including suspension and/or debarment.

2. The prospective contractor and lower tier participants shall provide immediate written notice to the Authority if at any time the prospective contractor and lower tier participants learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

3. The terms "covered transaction," “debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "persons," "lower tier 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 Orders 12549 and 12689. You may contact the Authority for assistance in obtaining a copy of those regulations.

4. The prospective contractor and lower tier participants agrees by submitting this bid or 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 in writing by the Authority.

5. The prospective contractor and lower tier participants further agrees by submitting this bid or proposal that it will require the language of this certification be included in all subcontracts and all lower tier participants shall certify compliance with this requirement**.**

6. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it 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 Non-procurement List issued by U.S. General Service Administration.

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

8. Except for transactions authorized under Paragraph 5 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 all remedies available to the Federal Government, the Authority may pursue available remedies including suspension and/or debarment.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion Lower Tier Covered Transaction

(1) The prospective contractor and lower tier participants certifies, by submission of this bid or 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) When the prospective contractor and lower tier participants is unable to certify to the statements in this certification, such prospective participant shall attach an explanation to this proposal.

The Contractor, _____ certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 2 CFR §180 apply to this certification and disclosure, if any.

Signature of Contractor’s Authorized Official: _____

Name and Title of Contractor’s Authorized Official: _____

Date:

CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING - 31 USC §1352
[Applicable to all federally assisted contracts and to all related subcontracts which exceed $100,000]

A bidder must submit to the Authority the below certification with its bid response for any federally assisted contract that exceeds $100,000. Bids that are not accompanied by a completed certification may be rejected as nonresponsive.

1. The undersigned Contractor certifies, 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. The undersigned also agrees 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.

3. 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 USC 1352 (as amended by the Lobbying Disclosure Act of 1995). 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.

The Contractor, _____ certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 USC 3801, *et seq.*, apply to this certification and disclosure, if any.

Signature of Contractor's Authorized Official: _____

Name and Title of Contractor's Authorized Official: _____

Date: _____

End of Federal Assurances

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.

D. Contract Method.

E. Work by Others.

F. Coordination.

G. Access for Testing and Inspection.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 – General Conditions.

B. Section 00 80 00 – Supplementary Conditions.

C. Section 01 29 73 - Schedule of Values.

D. All other Division 1 Specifications.

E. Division 26.

F. See Section 26 23 02 - Upgrade Existing Prime Power Switchgear for a list of abbreviations and for features of devices described in this Section.

1.3 LOCAL DATA AND COMMUNICATION

A. Work under this Contract requires telephone service for progress meetings and internet service for reporting, testing and remote SCADA access, troubleshooting and monitoring.

1. Telephone: The Contractor shall ensure telephone service is available in each community throughout the duration of work on site.

2. Internet Service: The Contractor shall furnish, install, and activate internet service at the power plant so that the SCADA system can be remotely accessed via the internet. Starlink Standard Internet, or approved equal

a. The Contractor shall be responsible for providing all equipment and accessories required to provide dedicated internet service to the power plant.

b. Contractor shall ensure the equipment is installed correctly and operational. The Starlink antennae shall be permanently mounted to the power plant structure prior to commissioning.

c. A new account, if required, shall be set up in the Utility name. The contractor shall pre-pay for 1 year of Base Internet Service with

the internet provider. Overages or additional features shall be the responsibility of the Utility.

d. Base Internet Service is defined as having the following minimum performance characteristics.

1) Download 20Mbps

2) Upload 5Mbps

3) Unlimited Monthly Data

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The purpose of this Project is to upgrade existing low-voltage, paralleling switchgear controls in rural Alaska communities of Nikolski, Ruby, Akiak, Saint George, Larsen Bay, and Deering.

B. The switchgear date of manufacture ranges from 2011 to 2017. The original or upgraded (revised) switchgear record drawings for each community are bound separately and included in the RFP. The operational status of the existing switchgear is unknown and varies by community. It is the Contractor's responsibility to ascertain what, if any, modifications have been made to the original switchgear controls and to provide a fully functional control system in accordance with these specifications.

C. Work under this Contract consists of modification and upgrade of existing switchgear to provide full manual and automatic paralleling control of existing gensets and testing and commissioning of the completed work. Bid items shall consist of the following:

1. Item 1: Nikolski: Perform the work described in 1.5 Description of Work below.

2. Item 2: Ruby: Perform the work described in 1.6 Description of Work below.

3. Item 3: Akiak: Perform the work described in 1.7 Description of Work below.

4. Item 4: Saint George: Perform the work described in 1.8 Description of Work below.

5. Item A1: Larsen Bay Hydro Additive Alternate #1: Perform the work described in 1.9 Description of Work below.

6. Item A2: Larsen Bay Diesel Additive Alternate #2: Perform the work described in 1.10 Description of Work below.

7. Item A3: Deering Additive Alternate #3: Perform the work described in 1.11 Description of Work below.

D. 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.

E. The Work also includes selective demolition of existing systems. Perform all demolition tasks as specified and required. Dispose of all demolition debris in accordance with Section 01 74 00 - Cleaning and Waste Management except as noted below.

1. Salvage all Woodward GCP Generator Controllers and associated I/O devices being removed and turn them over to the Authority.

F. Depending upon funding and other program considerations, the Contract may be revised in the future to include switchgear upgrades in additional communities. The Bid Schedule includes unit pricing to provide a basis of negotiation for future additional work as described in 1.12 Description of Work below.

1. Item U1: Unit Price for Master Section: Perform the work described in 1.12 B 1 Description of Work below.

2. Item U2: Unit Price for Generator Section: Perform the work described in 1.12 B 2 Description of Work below.

3. Item U3: Unit Price for Mechanical Engine Interface: Perform the work described in 1.12 B 3 Description of Work below.

4. Item U4: Unit Price for Additional Meter: Perform the work described in 1.12 B 4 Description of Work below.

1.5 NIKOLSKI DESCRIPTION OF WORK

A. Mobilize all required materials, equipment, tools, supplies, etc. and all required personnel to the project site in Nikolski, AK.

B. Maintain prime power in the community with limited outages scheduled in advance with the local utility.

C. Renovate existing switchgear as specified in Section 26 23 02 and in accordance with the Contract Documents. Take care to avoid damage to existing systems not being demolished and to equipment being salvaged. *Note - Existing DeviceNet Compact I/O Blocks to remain in service*:

1. Demolition work shall include but not be limited to:

a. Demolish one OIU, one bus meter, one station service meter, over/under frequency relay and over/under voltage relay, and three GCP's.

b. Demolish remaining unused wiring and devices from three previously removed Generator Protective Relays (GPR).

c. Demolish one PLC, rack mount server, Ethernet Switch(es) and Interface Connectors, GCP – MGate / IXXAT devices, Ethernet to Serial Gateway (NetBurner), and dial-up modem.

d. Demolish one backup PLC.

e. Demolish one wind generator meter and two load bank meters.

f. Demolish 120VAC switchgear cabinet lighting and UPS.

g. Demolish three 12VDC-24VDC Battery Voltage Converters.

h. Demolish 120VAC-24VDC Power Supply.

i. Demolish three 4-20mA air filter vacuum sensors.

j. Demolish two exhaust temperature RTD sensors (Note that Gen#1 is not equipped with an RTD).

k. Demolish FloScan fuel flow sensors. Cap, coil, label and abandon wiring in-place.

2. Installation work shall include but not be limited to:

a. Install one PLC and replacement Compact I/O devices.

b. Install one bus meter and one station service meter.

c. Install one wind turbine meter and two load bank meters.

d. Install three Genset Controllers (GC's) with Analog Signal Converters.

e. Install one Operator Interface Unit (OIU).

f. Install one data storage server.

g. For mechanically governed engines (Gen #1 and Gen #3) install Configurable Input/Output Modules (XM500) with new oil pressure and engine water temperature sensors.

h. Install 120VAC-24VDC Power Supply with UPS.

i. Install 24VDC control power system with Battery Buffer Module.

j. Install 24VDC LED enclosure illumination with motion sensor in each switchgear cabinet, 5 total.

k. Install three new air filter vacuum switches.

l. Install three new exhaust temperature RTD sensors.

m. Install Industrial Ethernet Switches, as required.

n. Install all switchgear devices as required.

o. Connect to existing devices and circuits as required.

p. Install all software and perform all programming.

D. Test and commission the completed work. See 1.13 Testing and Commissioning below for a description of tasks.

E. Upon completion of commissioning: Clean up the jobsite, remove and dispose of all trash and debris, turn over all salvaged materials to the Owner and remove all Contractor tools and equipment from the project site.

1.6 RUBY DESCRIPTION OF WORK

A. Mobilize all required materials, equipment, tools, supplies, etc. and all required personnel to the project site in Ruby, AK.

B. Maintain prime power in the community with limited outages scheduled in advance with the local utility.

C. Renovate existing switchgear as specified in Section 26 23 02 and in accordance with the Contract Documents. Take care to avoid damage to existing systems not being demolished and to equipment being salvaged. *Note - Existing DeviceNet Compact I/O Blocks to remain in service*:

1. Demolition work shall include but not be limited to:

   a. Demolish one PLC, rack mount server, Ethernet switch(es) and Interface Connectors, and GCP – MGate / IXXAT devices, and Ethernet to Serial Gateway (NetBurner).

   b. Demolish one OIU, one bus meter, one station service meter, and three GCP's.

   c. Demolish 120VAC switchgear cabinet lighting and UPS.

   d. Demolish one 12VDC-24VDC Battery Voltage Converter.

   e. Demolish 24VDC-24VDC Battery Voltage Converter and 120VAC-24VDC Power Supply.

   f. Remove and retain three existing 4-20mA air filter vacuum sensors.

   g. Remove three existing exhaust temperature RTD sensors.

2. Installation work shall include but not be limited to:

   a. Install one PLC and any replacement Compact I/O devices.

   b. Install one bus meter and one station service meter.

   c. Install three Genset Controllers (GC's) with Analog Signal Converters.

   d. Install one Operator Interface Unit (OIU).

   e. Install one data storage server.

   f. Install 120VAC-24VDC Power Supply with UPS.

   g. Install 12VDC-24VDC power supply (GEN2 switchgear cabinet).

   h. Install 24VDC control power system with Battery Buffer Module.

   i. Install 24VDC LED enclosure illumination with motion sensor in each switchgear cabinet, 5 total.

   j. Install three new air filter vacuum switches.

   k. Install three new exhaust temperature RTD sensors.

   l. Install Industrial Ethernet Switches, as required.

   m. Install all switchgear devices as required.

   n. Connect to existing devices and circuits as required.

   o. Install all software and perform all programming.

D. Test and commission the completed work. See 1.13 Testing and Commissioning below for a description of tasks.

E. Upon completion of commissioning: Clean up the jobsite, remove and dispose of all trash and debris, turn over all salvaged materials to the Owner, and remove all Contractor tools and equipment from the project site.

1.7 AKIAK DESCRIPTION OF WORK

A. Mobilize all required materials, equipment, tools, supplies, etc. and all required personnel to the project site in Akiak, AK.

B. Maintain prime power in the community with limited outages scheduled in advance with the local utility.

C. Renovate existing switchgear as specified in Section 26 23 02 and in accordance with the Contract Documents. Take care to avoid damage to existing systems not being demolished and to equipment being salvaged. *Note - Existing DeviceNet Compact I/O Blocks and FPR to remain in service*:

1. Demolition work shall include but not be limited to:

   a. Demolish one PLC, rack mount server, Ethernet switch(es) and Interface Connectors, and GCP – MGate / IXXAT devices, and Ethernet to Serial Gateway (NetBurner).

   b. Demolish four GCP's.

   c. Demolish 120VAC switchgear cabinet lighting and UPS.

   d. Demolish 24VDC-24VDC Battery Voltage Converter and 120VAC-24VDC Power Supply.

   e. Demolish four 4-20mA air filter vacuum sensors.

   f. Demolish four exhaust temperature RTD sensors.

   g. Note that the existing Shark meters are to remain in service.

   h. Note that the recently replaced OIU is to remain in service.

2. Installation work shall include but not be limited to:

   a. Install one PLC and any replacement Compact I/O devices.

   b. Install four Genset Controllers (GC's) with Analog Signal Converters.

   c. Install one data storage server.

   d. Install 120VAC-24VDC Power Supply with UPS.

   e. Install 24VDC control power system with Battery Buffer Module.

   f. Install 24VDC LED enclosure illumination with motion sensor in each switchgear cabinet, 6 total.

   g. Install four new air filter vacuum switches.

   h. Install four new exhaust temperature RTD sensors.

   i. Install Industrial Ethernet Switches, as required.

   j. Install all switchgear devices as required.

k. Connect to existing devices and circuits as required.

l. Install all software and perform all programming.

D. Test and commission the completed work. See 1.13 Testing and Commissioning below for a description of tasks.

E. Upon completion of commissioning: Clean up the jobsite, remove and dispose of all trash and debris, turn over all salvaged materials to the Owner, and remove all Contractor tools and equipment from the project site.

1.8 SAINT GEORGE DESCRIPTION OF WORK

A. Mobilize all required materials, equipment, tools, supplies, etc. and all required personnel to the project site in Saint George, AK.

B. Maintain prime power in the community with limited outages scheduled in advance with the local utility.

C. Renovate existing switchgear as specified in Section 26 23 02 and in accordance with the Contract Documents. Take care to avoid damage to existing systems not being demolished and to equipment being salvaged. *Note - Existing DeviceNet Compact I/O Blocks and two Feeder Protection Relays (FPR) to remain in service:*

1. Demolition work shall include but not be limited to:

a. Demolish one PLC, rack mount server, Ethernet switch(es) and Interface Connectors, and GCP – MGate / IXXAT devices, and Ethernet to Serial Gateway (NetBurner).

b. Demolish one OIU and four GCP’s.

c. Demolish 120VAC switchgear cabinet lighting and UPS.

d. Demolish 24VDC-24VDC Battery Voltage Converter and 120VAC-24VDC Power Supply.

e. Demolish four existing 4-20mA air filter vacuum sensors.

f. Demolish four existing exhaust temperature RTD sensors.

g. *Note that the existing Shark meters are to remain in service.*

2. Installation work shall include but not be limited to:

a. Install one PLC and any replacement Compact I/O devices.

b. Install four Genset Controllers (GC’s) with Analog Signal Converters.

c. Install one Operator Interface Unit (OIU).

d. Install one data storage server.

e. Install 120VAC-24VDC Power Supply with UPS.

f. Install 24VDC control power system with Battery Buffer Module.

g. Install 24VDC LED enclosure illumination with motion sensor in each switchgear cabinet, 7 total.

h. Install three new air filter vacuum switches.

i. Install four new exhaust temperature RTD sensors.

j. Install all switchgear devices as required.

k. Install Industrial Ethernet Switches, as required.

l. Connect to existing devices and circuits as required.

m. Install all software and perform all programming.

D. Test and commission the completed work. See 1.13 Testing and Commissioning below for a description of tasks.

E. Upon completion of commissioning: Clean up the jobsite, remove and dispose of all trash and debris, turn over all salvaged materials to the Owner, and remove all Contractor tools and equipment from the project site.

1.9 LARSEN BAY HYDRO DESCRIPTION OF WORK

A. Mobilize all required materials, equipment, tools, supplies, etc. and all required personnel to the project site in Larsen Bay, AK.

B. Maintain prime power in the community with limited outages scheduled in advance with the local utility. Note that the utility has a prime power diesel module in addition to the hydro plant.

C. In the hydro plant there is a single switchgear cabinet with a GCP, PLC, meters, relays, breakers, etc., plus an electric load bank with a dedicated SCR panel. In addition, there is an electric boiler at the nearby school that serves as a secondary load bank when there is a call for heat. At the school there is a remote control panel with a PLC, meter, relays, etc., plus a dedicated SCR panel.

D. Renovate existing switchgear as specified in Section 26 23 02 and in accordance with the Contract Documents. Take care to avoid damage to existing systems not being demolished and to equipment being salvaged. *Note- Existing DeviceNet Compact I/O Blocks and existing Feeder Protection Relay (FPR) to remain in service:*

1. Demolition work at the hydro plant shall include but not be limited to:

a. Demolish one PLC, Ethernet Switches and Ethernet/Fiber Switch, Interface Connectors, GCP – MGate / IXXAT devices, and Ethernet to Serial Gateway (NetBurner).

b. Demolish one GCP.

c. Demolish one 120VAC switchgear cabinet light.

d. Demolish 24VDC-24VDC Voltage Converter, 120VAC-24VDC Power Supply, and 120VAC to 5VDC Zero Cross Power Supply.

e. *Note that the existing Shark meters are to remain in service.*

2. Installation work at the hydro plant shall include but not be limited to:

a. Install one PLC and any replacement Compact I/O devices.

b. Install three Genset Controllers (GC's) with Analog Signal Converters.

c. Install one Operator Interface Unit (OIU).

d. Install one data storage server.

e. Install one 120VAC UPS.

f. Install 120VAC-24VDC Power Supply.

g. Install 120VAC-5VDC Zero Cross Power Supply.

h. Install 24VDC control power system with Battery Buffer Module.

i. Install one 24VDC LED enclosure illumination with motion sensor.

j. Install Industrial Ethernet Switches including Fiber Optic Port.

k. Install all switchgear devices as required.

l. Connect to existing devices and circuits as required.

m. Install all software and perform all programming.

3. Demolition work at the school boiler control panel shall include but not be limited to:

a. Demolish one PLC, Ethernet Switches and Ethernet/Fiber Switch, Interface Connectors, and Ethernet to Serial Gateway (NetBurner).

b. Demolish 120VAC-24VDC Power Supply and 120VAC to 5VDC Zero Cross Power Supply.

c. *Note that the existing Shark meter is to remain in service.*

4. Installation work at the school boiler control panel shall include but not be limited to:

a. Install one PLC and any replacement Compact I/O devices.

b. Install 120VAC-24VDC Power Supply.

c. Install 120VAC-5VDC Zero Cross Power Supply.

d. Install Industrial Ethernet Switch including Fiber Optic Port.

e. Install all switchgear devices as required.

f. Connect to existing devices and circuits as required.

g. Install all software and perform all programming.

E. Test and commission the completed work. See 1.13 Testing and Commissioning below for a description of tasks.

F. Upon completion of commissioning: Clean up the jobsite, remove and dispose of all trash and debris, turn over all salvaged materials to the Owner, and remove all Contractor tools and equipment from the project site.

1.10 LARSEN BAY DIESEL PLANT DESCRIPTION OF WORK

A. Mobilize all required materials, equipment, tools, supplies, etc. and all required personnel to the project site in Larsen Bay, AK.

B. Maintain prime power in the community with limited outages scheduled in advance with the local utility. Note that the utility has a prime power hydro power plant module in addition to the diesel module.

C. Renovate existing switchgear as specified in Section 26 23 02 and in accordance with the Contract Documents. Take care to avoid damage to existing systems not being demolished and to equipment being salvaged. *Note- Existing DeviceNet Compact I/O Blocks and existing Feeder Protection Relay (FPR) to remain in service:*

1. Demolition work shall include but not be limited to:
    a. Demolish one PLC, rack mount server, Ethernet switch(es) and Interface Connectors, and GCP – MGate / IXXAT devices, and Ethernet to Serial Gateway (NetBurner).
    b. Demolish one OIU and three GCP's.
    c. Demolish 120VAC switchgear cabinet lighting and UPS.
    d. Demolish 24VDC-24VDC Voltage Converter and 120VAC-24VDC Power Supply.
    e. Demolish three 4-20mA air filter vacuum sensors.
    f. Demolish three exhaust temperature RTD sensors.
    g. *Note that the existing Shark meters are to remain in service.*
2. Installation work shall include but not be limited to:
    a. Install one PLC and any replacement Compact I/O devices.
    b. Install Industrial Ethernet Switches including Fiber Optic Port.
    c. Install three Genset Controllers (GC's) with Analog Signal Converters.
    d. Install one Operator Interface Unit (OIU).
    e. Install one data storage server.
    f. Install 120VAC-24VDC Power Supply with UPS.
    g. Install 24VDC control power system with Battery Buffer Module.
    h. Install 24VDC LED enclosure illumination with motion sensor in each switchgear cabinet, 5 total.
    i. Install three air filter vacuum switches.
    j. Install three exhaust temperature RTD sensors.
    k. Install Industrial Ethernet Switches, as required.
    l. Install all switchgear devices as required.

m. Connect to existing devices and circuits as required.

n. Install all software and perform all programming.

D. Test and commission the completed work. See 1.13 Testing and Commissioning below for a description of tasks.

E. Upon completion of commissioning: Clean up the jobsite, remove and dispose of all trash and debris, turn over all salvaged materials to the Owner, and remove all Contractor tools and equipment from the project site.

1.11 DEERING DESCRIPTION OF WORK

A. Mobilize all required materials, equipment, tools, supplies, etc. and all required personnel to the project site in Deering, AK.

B. Maintain prime power in the community with limited outages scheduled in advance with the local utility.

C. The existing switch gear was originally fabricated in 2000 and has been renovated multiple times. It presently has backpan mounted Easygen 3100 controllers but does not contain any DeviceNet I/O blocks. The switchgear also integrates with a proprietary ABB supervisory SCADA that controls wind and photovoltaic generation and battery energy storage.

D. Renovate existing switchgear as specified in Section 26 23 02 and in accordance with the Contract Documents. Take care to avoid damage to existing systems not being demolished and to equipment being salvaged.

1. Demolition work shall include but not be limited to:

a. Demolish four backpan mounted Easygen 3100's, four generator power meters, four generator frequency meters, and associated devices.

b. Demolish one bus (main totalizing) meter, station service meter, west feeder meter, east feeder meter, east-west feeder meter, energy recovery heater meter, water treatment plant meter, one sync scope and associated lights and contacts.

c. Demolish one PLC, Ethernet Switch(es) and Interface Connectors.

d. Demolish 120VAC switchgear cabinet lighting.

2. Installation work shall include but not be limited to:

a. Install one PLC and all required distributed point-to-point I/O devices. *Note that existing switchgear is not equipped with DeviceNet Compact I/O Blocks.*

b. Install bus meter, station service meter, west feeder meter, east feeder meter, energy recovery heater meter, and water treatment plant meter.

c. Install four Genset Controllers (GC's) with Analog Signal Converters.

d. Install one Operator Interface Unit (OIU).

e. Install one data storage server.

f. For mechanically governed engine on Generator #3: Install Configurable Input/Output Module (XM500) with new oil pressure and engine water temperature sensors.

g. Install 24VDC control power system with Battery Buffer Module

h. Install 24VDC LED enclosure illumination with motion sensor in each switchgear cabinet, 5 total.

i. Install two air filter vacuum switches and exhaust temperature RTD sensors on Gen #2 and Gen #3 and route wiring to switchgear.

j. Install Industrial Ethernet Switches, as required.

k. Install all switchgear devices as required.

l. Connect to existing devices and circuits as required.

m. Install all software and perform all programming.

E. Test and commission the completed work. See 1.13 Testing and Commissioning below for a description of tasks.

F. Upon completion of commissioning: Clean up the jobsite, remove and dispose of all trash and debris, turn over all salvaged materials to the Owner, and remove all Contractor tools and equipment from the project site.

1.12 UNIT PRICING FOR FUTURE WORK

A. The purpose of the unit pricing is to provide a basis of negotiation for future additional work as described below. Unit prices shall be based on the following criteria:

1. The unit price shall include all labor, materials, supervision, equipment, tools, quality control, and supplies required to demolish existing equipment and to furnish, install, test, and commission the item described below in accordance with the Contract Documents.

2. The unit price shall not include freight, travel, lodging, per-diem, or other camp/field office expenses. Those expenses will be negotiated for each specific site.

3. The unit price shall not include specialty items that are not part of the specifications such as feeder protection relay, replacement generator breaker, etc. The cost of those items, when required, will be negotiated.

B. Provide unit prices for the following items:

1. Master Section shall include but not be limited to:

a. Install one PLC and replacement Compact I/O devices.

b. Install one bus meter and one station service meter.

c. Install one Operator Interface Unit (OIU).

d. Install one data storage server.

e. Install all switchgear devices as required.

f. Install one 120VAC-24VDC Power Supply with UPS

g. Install 24VDC control power system with Battery Buffer Module

h. Install 24VDC LED enclosure illumination with motion sensor.

i. Install Industrial Ethernet Switches.

j. Connect to existing devices and circuits as required.

k. Install all software and perform all programming.

2. Generator Section shall include but not be limited to:

a. Install one Genset Controller (GC) with three analog Signal Converters.

b. Install air filter vacuum switch and route new conductors to switchgear.

c. Install exhaust temperature RTD sensor and route conductors to switchgear.

d. Install 12VDC to 24VDC power supply.

e. Install 24VDC LED enclosure illumination with motion sensor.

f. Install all switchgear devices as required.

g. Connect to existing devices and circuits as required.

h. Install all software and perform all programming.

3. Mechanical Engine Interface shall include but not be limited to:

a. Install one configurable Input/Output Module (XM500). Install new water temperature and oil pressure sensors, and connect to existing magnetic pickup as required.

b. Install all software and perform all programming.

4. Additional Meter shall include but not be limited to:

a. Install one meter equivalent to the station service meter with associated devices and accessories.

b. Connect to existing devices and circuits as required.

c. Install all software and perform all programming.

1.13 TESTING AND COMMISSIONING

Note that the following requirements apply to all communities under the Base Bid and the Additive Alternates.

A. Testing and Commissioning shall coincide with Substantial Completion. Provide written notice to the Authority in accordance with 01 77 00 Contract Closeout.

B. Upon approval of submittals, AEA will provide two project specific checklists to the Contractor: one for Substantial Completion and one for Testing and Commissioning. Note that generic example checklists are included at the end of this section to show the type of detail to be included in the final.

C. Prior to the arrival of the Authority for Substantial Completion, the Contractor shall:

1. Verify completion of all tests of electrical systems as required by the Contract Documents including but not limited to phase rotation tests and continuity tests. Test reports shall be completed, signed, dated, and shall include photographic documentation.

2. Review the Substantial Completion checklist to confirm that all work is or will be substantially complete prior to testing.

3. Review the Testing and Commissioning checklist to confirm that all materials, equipment, supplies, and personnel required to functionally test all systems are on site and available.

4. Using the Testing and Commissioning checklist as a guide, run switchgear through preliminary tests to verify it performs the sequences of operations as specified.

D. The Contractor shall functionally test and commission the completed work in the presence of the Authority or their designee. Tasks shall include but not be limited to:

1. Provide a minimum 100kW portable load bank with all required cables and connectors connected to the switchgear feeder breaker and to a 120VAC control power source.

2. Temporarily reduce the demand control settings as required to allow the system to perform step up and step down functions with the connected load bank. Note that if there is adequate community load on the system to allow demand control testing at reduced settings the load bank does not need to be used.

3. Run through a complete functional test of the switchgear system including automatic and manual start/stop, paralleling, load sharing, demand control, service, engine, and safety shut downs.

4. Test all data and communication systems including PLC, operator interface screens, and other devices. Demonstrate proper operation of SCADA system on all devices within the plant via the LAN and also on a remote computer via WAN internet connection.

5. Reset the demand control to the design settings.

6. Train local power plant operators in the operation of all new equipment and systems.

1.14 CONTRACT METHOD

A. This Contract is lump sum for the Base Bid communities 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 and Section 01 29 73 - Schedule of Values.

B. For any Additive Alternates selected, the Contract will be lump sum 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 and Section 01 29 73 - Schedule of Values.

C. For any future work awarded the contract will be based on unit pricing as shown on the Section 00 32 00 – Bid Schedule plus other site specific costs which are subject to negotiation.

1.15 WORK BY OTHERS

A. All work shall be included in this Contract except for tasks specifically indicated as being performed by others.

1.16 COORDINATION

A. Coordinate Work to assure efficient and orderly sequence of installation.

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

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

1.17 ACCESS FOR TESTING AND INSPECTION

A. Provide access for the Authority and the Engineer to the site. Provide on-site transportation, ladders, lifts, etc. for inspection and testing of the work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

PROJECT SCHEDULE CRITICAL DATES

Pre-Bid Meeting	See 001150a Special Notice to Bidders
Bid Opening	See 00 02 00 Invitation to Bid
Substantial Completion (First Four Base Bid Projects)	December 15, 2024
Final Completion	Dependent Upon Additive Alternates and Optional Future Renewals

See Proposal Evaluation Criteria, Section 00 23 00, for additional schedule information.

END OF SECTION

AEA M&I SWITCHGEAR - "NAME"
PRE-TESTING SUBSTANTIAL COMPLETION INSPECTION CHECKLIST

Generators	**Gen #1**	**Gen #2**	**Gen #3**	**Gen #4**
Generator Control J-Box Wiring Complete & Secure				
Control Wires Labeled, Terminations Tight, No Wear Points				
Power Wires Phase Taped, Lugs Tight, No Wear Points				
Bushings Grounded, Throats Insulated on Enclosures				
Liquid Tight Flex Ends Made Up Tight				
Exhaust Temperature Sensor Installed & Wired (where present)				
Air Filter Vacuum Sensor Installed & Wired (where present)				
Exhaust Temperature Sensor Installed & Wired (where present)				
CAC Intake Air Temp Sensor Installed & Wired (where present)				
Oil Level Site Gauge / Switch Installed & Wired (where present)				
Switchgear Generator Sections	**Gen #1**	**Gen #2**	**Gen #3**	**Gen #4**
Switchgear Upgrades Completed per specifications				
Power Wires Phase Taped, Lugs Tight				
Control Wires Labeled, Terminations Tight				
Verify 12 or 24VDC Engine Battery Power				
Switchgear Master & Feeder/VFD Sections				
Power Wires Phase Taped, Lugs Tight				
Control Wires Labeled, Terminations Tight				
Turn Off AC Power and Verify 12 or 24VDC Engine Power				
Ground Bus Permanently Bonded				
Refer to 1-Line Diagram re: need for temporary Ground Bus to Neutral Bond - when testing isolated from stepup xfrm				
Ground Bus or Structure TEMPORARILY Grounded to Rod or Equivalent				
Control Wiring				
Raceway Supports Complete & Secure				
Conduit & Flex Compression Fittings Tight				
Blank Cover Plates Installed				
Instrument Cables Secured				
Light Switching (nightlight & camera control - where applicable)				
Heating & Ventilation				
Verify ET-1 Low Level Switch signal to Master Section				
HR Flow Meter signal to Master Section				
Fuel System				
Verify Low Fuel Level signal to Master Section				
~~Verify Relay 8 (each easygen) powers open Inter Tank 24VDC actuator valve~~				
AEA M&I Switchgear Substantial Completion Acceptance - Ready for Testing				
Contractor Signature, Printed Name, & Date				
AEA Staff Signature, Printed Name, & Date				

AEA M&I SWITCHGEAR - "NAME"
TESTING & COMMISSIONING CHECKLIST

Verify Convenience Outlet (Y/N); Verify Radiator ~~and CAC VFD Breaker~~ Overload Settings: Date: Time: Rad1_____, Rad2_____, ~~Rad3_____, Rad4_____~~, CAC1_____, CAC2_____, CAC3_____, ~~CAC4_____~~			
Radiator Correct Rotation - VFD/Bypass Mode	R1: \	R2: \	R3: \
CAC Correct Rotation - VFD/Bypass Mode	CAC1: \	CAC2: \	CAC3: \
Step #1 Engine/Generator Control Verification Date:		Start Time:	Stop Time:
With **System Mode Switch in MAN**, Start each genset one at a time in Manual Mode: Verify correct phase rotation, manually adjust and verify speed and voltage bias polarity			
Generators Running Individually	**Gen #1**	**Gen #2**	**Gen #3**
Correct Polarity (Y/N)			
Correct speed bias polarity (Y/N)			
Correct voltage bias polarity (Y/N)			
Rated Engine Speed = 1800 rpm (Y/N)			
Step #2 Generator Section Alarms/Safeties Date:		Start Time:	Stop Time:
System Mode Switch = MAN. Use load bank(s) connected to feeder breaker, as applicable. **Set to ____kW,** Verify proper operation of all engine/generator monitoring, controls and safety shutdowns. Parallel two gensets in Manual Mode and *verify all pre-alarm and alarm setpoints and breaker trip settings per attached Table on Page 6*. **Adjust GC Flexible Limits for Oil Pressure, Air Filter Vacuum, Coolant & Exhaust Temp. Adjust GC speed setpoint to verify O/U Frequency, O/U Voltage and Reverse Power.** *Verify annunciator lamp illuminates for each alarm condition*			
Refer to Alarm & Demand Table:	**Gen #1**	**Gen #2**	**Gen #3**
Verify GC Setpoints Per Table:			
Verify Gen Breaker Trip Settings Per Table			
Verify Radiator VFD Set Points	R1	R2	R3
Verify CAC VFD Set Points	CAC2	CAC3	CAC4
Step #3 Master Section Alarms/Safeties Date:		Start Time:	Stop Time:
System Mode Switch = MAN. Use load bank(s) connected to feeder breaker, as applicable. Set to ____kW, Start and Parallel **ALL** gensets in Manual Mode and Verify operation of all Master Section Safeties/Shutdowns. **Verify appropriate annunciator lamp illuminates for each alarm condition**			
Fire Alarm:	E-Stop:	Low Coolant:	Fuel Level:
Feeder Breaker 1: Trip___Fail to Close:____ ~~Feeder Breaker 2: Trip___Fail to Close:____~~	Sys Not in Auto:	SS Breaker Open:	PLC Failure:
Step #4 Manual Operation Date:		Start Time:	Stop Time:
System Mode Switch = MAN, Load Bank ____kW. Operate all generators individually and in parallel against load bank. Manually open and close contactor/feeder breaker. Verify data communication is working correctly for each generator.			
Generators Running Individually	**Gen #1**	**Gen #2**	**Gen #3**
RPM / Frequency (Hz)			
Generators Running in Parrallel - Manually start/parallel ALL gensets, **Load Bank ____kW, verify = load share**			
Gen #1, Gen #2 & Gen #3 (kW each)			
Gen #1 w/ Gen #2 (kW each)			--------
Gen #1 w/ Gen #3 (kW each)		--------	
Gen #2 w/ Gen #3 (kW each)	--------		

Step #5 Manual Operation - Overall Plant Systems / SCADA Verification			
System Mode Switch = MAN, Load Bank ___kW. Verify cooling system is upto normal operating temperature. .			
Verify SCADA pages display on master OIU the same as on the laptop/desktop and remote SCADA. Verify Internet Communication – Have someone at remote location access SCADA system (and cameras, if applicable).			
Master Section OIU Matches PowerView (Y/N)			
Desktop Matches PowerView (Y/N)			
Remote SCADA Matches OIU (Y/N)			
SYSTEM PAGE	**Gen #1**	**Gen #2**	**Gen #3**
Contactor/Breaker Indication (Y/N)			
kW, V, A, Hz, PF Indication (Y/N)			
VFD/Stop/Auto/Alarm / Lead Indication/L (Y/N)			
Feeder 1/2 Indication (Y/N), kW_____ /_____	Bus kW:	Rad VFD kW:	SS kW:
System Control Indication:	kW:	Auto/Manual	Bus Alarm
Ambient Temperature Readings:	Inside (F)	Outside (F)	VFD (F)
DEMAND PAGE			
Online Capacity Indication: ___kW and ____%	**Demand Control**	Enabled:	Disabled:
Metering (kW): Bus____, SS____, Fdr_____	Gen1 kW:	Gen2 kW:	Gen3 kW:
Verify Demand Control settings per Tables.	**refer to attached Demand Control Table on Page 6**		
Generator Priority Selection	Gen1	Gen2	Gen3
BUS PAGE	**Verify proper operation of all annunciator lights**		
Verify Bus Metering readings are same as below on each GC when running one genset			
System Mode (Auto/Manual)	SS Breaker (O/C)	Feeder Breaker 1 (O/C)	Feeder Breaker 2 (O/C)
Total Fuel Used _____ gallons	_____kWh/Gal	Reset Peak works (Y/N)	
GENERATOR PAGES	**Gen #1**	**Gen #2**	**Gen #3**
Verify operation of all annunciator lights (Y/N)			
Mode Auto/Manual Indication (Y/N)			
Contactor/Breaker Indication (Y/N)			
RPM / Frequency (Hz)			
Volts / Amps (Phase A)			
Volts / Amps (Phase B)			
Volts / Amps (Phase C)			
Oil Pressure (PSI)			
Filter Vacuum (in H2O)			
Intake Air Temp - Max Observed (Deg F)			**N/A**
Coolant Temp - Max Observed (Deg F)			
Return Temp - Max Observed (Deg F)			
Exhaust Temp - Max Observed (Deg F)			
Fuel Consumption (GPH)			
Fuel Efficiency (kWH/Gal)			
Engine Screen Matches PowerView (Y/N)			

Step #5 Manual Operation - Overall Plant Systems / SCADA Verification, Continued			
Hrs to Svc / Eng Hrs	/	/	/
Start Count / Power Factor	/	/	/
Verify appropriate annunciator lamps illuminate for each alarm/fault			
FUEL PAGE - Indicate what is presented			
Verify Fuel Meter Pulser Meter Input	Efficiency (30 min) _____kWh/gal	Efficiency (Total) _____kWh/gal	
	Fuel Usage _____ gal	Last Fill _____ gal	
HEAT RECOVERY SYSTEM PAGE - Verify cooling system is hot enough for operation of thermostatic valve and radiators. Turn on heat recovery system and circulate to operating temperature. Verify all readings and calibration of temp sensors and thermometers and confirm SCADA readings			
Verify proper operation of all annunciator lights			
Heat Recovery System: _____Pressure (PSI)	_____Supply Temp (F)	_____Return Temp (F)	
Heat Recovery System: _____Flow (GPM)	_____Output BTU (100k)	_____BTU/Hour	
Verify on HRS Page: Alarm/No Load/No Flow/Low Pressure/Supply&Return Temp Signal Loss Indication			
Verify Master Section Annunciate: No Load	HR Loss of Press:	HR Loss of Flow:	High Coolant Temp:
RADIATOR / CAC VFD PAGE			
Running Indicator - On / Off	R1	R2	~~R3~~
Fault Indicator	R1	R2	~~R3~~
Breaker Status - OPENED	R1	R2	~~R3~~
Radiator Temp - Max Observed (Deg F)	R1	R2	~~R3~~
Radiator VFD Frequency - Max Observed (Hz)	R1	R2	~~R3~~
Coolant Return Temp - Max Observed (Deg F)	R1	R2	~~R3~~
~~CAC Running Indicator - On / Off~~	CAC2	CAC3	CAC4
~~CAC Fault Indicator~~	CAC2	CAC3	CAC4
~~CAC Breaker Status - OPENED~~	CAC2	CAC3	CAC4
~~CAC Temp - Max Observed (Deg F)~~	CAC2	CAC3	CAC4
~~CAC VFD Frequency - Max Observed (Hz)~~	CAC2	CAC3	CAC4
~~CAC Return Temp - Max Observed (Deg F)~~	CAC2	CAC3	CAC4
ALARM PAGE - Verify Alarm Page functions, Document what is presented			
TRENDING PAGE - Verify Trending functions, Document what is presented			

Step #6 UPS/24VDC Test Date: Start Time: Stop Time:

Verify UPS Function – Temporarily turn off switchgear control power circuit breaker **22** in Station Service Panel.

Verify Data Storage Server is powered (Y/N)

Verify 120VAC / 24VDC Power Supply Function – Temporarily turnoff circuit breakers **M-CB12 and M-CB13** in master section.

Verify Control Power is ON (Y/N); Verify PLC is ON (Y/N); Verify OIU is ON (Y/N)

Verify 12/24VDC Converters / Best Battery Function – Temporarily turn off circuit breaker **M-CB13&14** in master section - verify 24VDC control power from each generator section by turning off breaker **CB-11** in ALL gen sections except one. Repeat for each gen section. **Verify 24VDC power avail in Master and ALL Gen Sections**

Power from Gen #1 (Y/N); Power from Gen #2 (Y/N); Power from Gen #3 (Y/N); Power from Gen #4 (Y/N)

Verify Battery Buffer Operation – Temporarily turnoff circuit breakers **M-CB12&14** in master section
Verify (*quickly*) 24VDC power is on in Master and ALL Gen Sections

Power from Gen #1 (Y/N); Power from Gen #2 (Y/N); Power from Gen #3 (Y/N); Power from Gen #4 (Y/N)

Step #7 Automatic Operation Date: Start Time: Stop Time:

Confirm demand control settings per Page 6 Table. *Allow time for system to stabilize and record indicated data. Note if load is insufficient to excede Level 2 Increase, temporarily proportionately reduce the Increase & Decrease Levels to verify automatic operation and record on attached Demand Table and record Load Bank/Bus kW, below.*
NOTE: if SCADA is not equipped with PRIORITY, set Lead Unit to Manual to confirm other Lead genset starts
Set Load above Level 2 Increase, and ALL easygens to AUTO. Set System Mode Switch to AUTO for black start Automatic Operation. Confirm ALL gensets start and parallel to the bus and the feeder breaker/contactor closes. Then reduce load below Level 2 Decrease. Change the Priority of each genset per below table to test function at Level 2. Reduce load below Level 1 Decrease and change Priority of each genset per below table. Increase load above Level 2 Increase. Place the Priority 1 genset in MANUAL mode to verify Priority 3 genset starts and goes on line and all three gensets share load equally. Change the Priority per the below table and record. Set ALL gensets to AUTO and increase load above Level 2 Increase. Verify ALL gensets parallael to bus, then reduce load to 40kW and continue with Oil Change, below.
IF DEMAND CONTROL SETTINGS WERE CHANGED, RESET & Confirm Settings per Table on Page 6 (Y/N):

Automatic Black Start Successful (Y/N): Feeder Breaker or Contactor Closed Automatically (Y/N):

Step No.	Record Load Bank (kW)	Demand Control Level	Record Total Bus Load (kW)	Set Lead Unit	Generator #1		Generator #2		Generator #3	
					Priority	Record Gen#1 Load(kW)	Priority	Record Gen#2 Load(kW)	Priority	Record Gen#3 Load(kW)
1	kW	Level 3		Gen #1	1		2		3	
2	kW	Level 2		Gen #1	1		2		3	OFF
3	kW	Level 2		Gen #2	3	OFF	1		2	
4	kW	Level 2		Gen #3	2		3	OFF	1	
5	kW	Level 1		Gen #1	1		2	OFF	3	OFF
6	kW	Level 1		Gen #2	3	OFF	1		2	OFF
7	kW	Level 1		Gen #3	2	OFF	3	OFF	1	
8	kW	Level 2		Gen #1	*1-Manual*		2		3	
9	kW	Level 2		Gen #2	3		*1-Manual*		2	
10	kW	Level 2		Gen #3	2		3		*1-Manual*	
11	kW	Level 3		Gen #1	1		2		3	

AEA M&I SWITCHGEAR - "NAME"
TESTING & COMMISSIONING CHECKLIST

Step #8 Oil Change Procedure Date: Start Time: Stop Time:

All gensets in AUTO & System Mode Switch in AUTO. Load bank = ___kW, run through Oil Change procedure for Gen1. Demonstrate how to reset Engine Service Hours but DO NOT reset. Repeat for Gens 2&3.

Plant Running in Automatic Mode Priority 1 (Lead) Genset Online and in Auto Mode (Y/N)

Step No.	Set Load Bank (kW)	Demand Control Level	Record Total Bus Load (kW)	Lead Unit	Generator #1		Generator #2		Generator #3	
					Priority/ Lead	Record Gen#1 Load(kW)	Priority/ Lead	Record Gen#2 Load(kW)	Priority/ Lead	Record Gen#3 Load(kW)
1	___kW	Level 1		Gen1	1		2	OFF	3	OFF
2		**Change Gen1 Oil Per Instructions Above**								
2	___kW	Level 1		Gen1	*1-Manual*	OFF	2		3	OFF
3		**Change Gen2 Oil Per Instructions Above**								
3	___kW	Level 1		Gen2	3	OFF	*1-Manual*	OFF	2	
4		**Change Gen3 Oil Per Instructions Above**								
4	___kW	Level 1		Gen3	2		3	OFF	*1-Manual*	OFF
5		**Return System to Normal Auto Operation**								
5	___kW	Level 1		Gen1	1		2	OFF	3	OFF

Verity each Oil Level Switch is properly Adjusted and Marked

Return ALL gensets to Auto mode. TESTING COMPLETE.

Step #9 Prepare for Black Start Start Time:

Shut Down – Reduce the load on the load bank to 0kW. Place all gensets in Manual Mode. On Gen1 press the easygen Stop button. Allow to cool down and shut off.
SET SYSTEM MODE SWITCH TO MAN
Connect to Grid - Disconnect load bank and reconnect power plant to step-up transformer (if applicable).

Step #10 Black Start Village Start Time: Date: Outside Temp (F):

All gensets in AUTO. Set System Mode Switch to AUTO. Plant will run through Automatic Operation black start procedure. Observe Demand Control Operation. After system stabilizes in normal operation record Bus load, Bus metering data, and Station Service kW load.

Bus kW	Bus Voltage: Phase A	Phase B	Phase C
Station Service kW	Bus Current: Phase A	Phase B	Phase C
Online easYgen: NextPage/Measure Values/Generator/Down Arrow:	kW: Phase A	Phase B	Phase C
	VARS: Phase A	Phase B	Phase C
	PF: Phase A	Phase B	Phase C

M&I Switchgear Final Testing & Commissioning - Acceptance

Contractor Signature, Printed Name, & Date

AEA Staff Signature, Printed Name, & Date

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. 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. 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 Manager's signature.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

ALASKA ENERGY AUTHORITY	SUBCONTRACTOR CERTIFICATION	ALASKA ENERGY AUTHORITY

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: Term Contract for 2024 M&I Switchgear Upgrade Projects PROJ. #: 25002

PRIME CONTRACTOR: _____

Pursuant to the Contract Documents, we hereby stipulate the following concerning the award of Work to the last Subcontractor on the following list:

1. First Tier Subcontractor: _____ DBE? **Yes**☐ **No**☐

   Second Tier: _____ DBE? **Yes**☐ **No**☐

   Third Tier: _____ DBE? **Yes**☐ **No**☐

   Fourth Tier: _____ DBE? **Yes**☐ **No**☐

2. Date of Subcontract: _____

3. Amount of Subcontract: $ _____

4. Scope of Work: _____

   _____

5. Are the following documents kept on file by both the Contractor and the Subcontractor (check the appropriate answer)?

   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 Authority and does it contain waiver provisions and termination provisions as required by the Contract Documents?

   Yes☐ **No**☐

8. a. Does the Subcontractor have adequate insurance coverages as specified in the Contract Documents?

   Yes☐ **No**☐

   If not, does the Contractor stipulate that the insurance limits of the Subcontractor are acceptable to the Contractor and that he has notified his insurance carrier of the reduced insurance limits?

   Yes☐ **No**☐

   b. Does the evidence of insurance certify that the policies described thereon comply with all aspects of the insurance requirements for this project?

   Yes☐ **No**☐

Subcontractor Name: _____

c. Does the evidence of insurance list the Authority 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 Manager

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

_____

_____

Signature: _____ Date: _____
Project Manager

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.

E. Section 01 29 73 – Schedule of Values.

F. Section 01 29 76 – Application for Payment.

G. Section 01 32 16 – Construction Progress Schedule.

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 the 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, Article 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 Order Request form provided by the Authority. The Authority may respond by rejecting it, or with an RFP to initiate contract change. The Contractor's Change Order Request 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, Article 15 Claims 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, the basis of pricing shall be estimated. For work performed prior to the execution of a Change Order, 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, Article 10.

3. Other information as required by the Authority.

D. Upon receipt of pricing response to an 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.

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, Article 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, Article 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 Authority 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: NOT USED.

F. The Authority shall have the right to audit all records in possession of the Contractor relating to activities covered by the Contractor's pricing of Contract CHANGE ORDER PROCEDURES, including Cost of the Work pricing, as set forth in Section 00 70 00 – General Conditions. If the 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 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 and the inclusion of the Change Order by reference on the Application for Payment form.

D. Payment shall not be made for Work authorized via Interim Work Authorization until such work is formalized in a Change Order.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

ALASKA ENERGY AUTHORITY

REQUEST FOR INFORMATION or INTERPRETATION

Project: Term Contract for 2024 M&I Switchgear Upgrade Projects

R.F.I. Number: _____

From: _____

Date: _____

To: Alaska Energy Authority

A/E Project Number: _____

Contract For: _____

Re:

Specification Section: Paragraph: Drawing Reference: Detail:

Request:

Signed by: Date:

Response:

☐ Attachments:

Response From: To: Date Rec'd:

Signed by: Date:

Copies: ☐ Owner ☐ Consultants ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ File

ALASKA ENERGY AUTHORITY

CHANGE ORDER REQUEST (PROPOSAL)

Project: Term Contract for 2024 M&I Switchgear Upgrade Projects

R.F.I. Number: _____

From: _____

Date: _____

To: Alaska Energy Authority

A/E Project Number: _____

Contract For: _____

Re:

This Change Order Request (C.O.R.) contains an itemized quotation for changes in the Contract Sum or Contract Time in response to proposed modifications to the Contract Documents based on Proposal Request No. _____ .

Description of Proposed Change:

Attached supporting information from: ☐ Subcontractor ☐ Supplier ☐ _____ ☐ _____ _____

Reason For Change:

Does Proposed Change involve a change in Contract Sum? ☐ No ☐ Yes [Increase] [Decrease] $ _____

Does Proposed Change involve a change in Contract Time? ☐ No ☐ Yes [Increase] [Decrease] _____ days.

Attached pages: ☐ Proposal Worksheet Summary: _____

☐ Proposal Worksheet Detail(s): _____

Signed by: Date:

Copies: ☐ Owner ☐ Consultants ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ File

ALASKA ENERGY AUTHORITY

Directive

Project No.: 25002

Directive No.: 000

Project Name: Term Contract for 2024 M&I Switchgear Upgrade Projects

Contractor: _____

Address: _____

_____

_____

Scope of this Directive
☐ Commencement of Work
☐ Suspension of Work
☐ Contract Non-Conformance
☐ Contract Clarification

Directive issued By: _____ Date: _____
Engineer or AEA Project Manager

Receipt Acknowledged By: _____ Date: _____
Contractor's Representative:

This Directive complements, and is used in accordance with the terms and provisions of the above referenced Contract, and shall not serve to authorize a change in Contractual responsibility. If the CONTRACTOR believes that any condition in this document may affect Contract Time, Price, or Requirement the CONTRACTOR shall immediately notify the DEPARTMENT of such condition. Contract Performance is required as follows:

DESCRIPTION

X

If the Contractor believes this Directive will adjust the Contract time or price the Contractor shall provide a Changer Order Request (COR) to the Authority, within 14 calendar days.

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 16 – Construction Progress Schedule.

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 the Authority.

B. Form shall have a signature block for submission by Contractor and a signature block for approval by the Authority.

C. Content shall include the following column headings.

1. Pay Item Activity Number.
2. Pay Item Activity Description.
3. Pay Item Activity 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 Construction Project 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: NOT APPLICABLE

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.

1.5 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.

1.6 SUBMITTAL

A. Submit proposed Schedule of Values with updated Construction Project Schedule per specification sections for Summary of Work, Construction Progress Schedule, 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.

1.7 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 16 - Construction Progress Schedule

H. Section 01 77 00 – Contract Closeout Procedures.

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, or as otherwise agreed upon. 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 16 - Construction Progress Schedule.

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 Project Manager 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, and Section 01 32 16 - Construction Progress Schedule).

3. Schedule of Values (Section 00 70 00 – General Conditions, Paragraph 6.6.2, and 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 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 16 - Construction Progress Schedule.

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 GENERAL REQUIREMENTS

A. All project meetings will be conducted telephonically unless specifically arranged to be held in person.

1.4 PRECONSTRUCTION CONFERENCES

A. The Authority will administer preconstruction conference for execution of Contract and exchange of preliminary submittals. Attendance by all key Contractor and Subcontractor personnel is required.

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

1.5 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.

1.6 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. The minimum frequency will be typically two times per week during active construction on site.

C. Progress Meeting shall be attended by all key Contractor personnel and, as appropriate, key Subcontractor personnel.

D. The Contractor shall furnish copies of its updated schedule, per Section 01 32 16 - Construction Progress Schedule, 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.

E. Progress Meetings will be used to review status, schedule, safety, quality, critical items, and other key aspects of the Work.

1.7 SAFETY MEETING

A. The Contractor shall conduct Safety Meetings as required by its project Safety Program. Safety Meetings shall be documented in the daily work report.

B. The Contractor shall invite the Authority to attend Safety Meetings.

1.8 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 16

CONSTRUCTION PROGRESS SCHEDULE

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

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 32 26 - Construction Progress Reporting.

I. Section 01 33 00 – Submittal Procedures.

1.3 SUBMITTALS

A. Within four (4) calendar weeks of the contract award the Contractor shall submit a preliminary schedule.

B. Within two (2) calendar weeks of receipt of review comments from the Authority the Contractor shall submit a revised schedule.

C. An updated schedule shall be submitted with each Application for Payment.

1.4 SCHEDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

B. Diagram Sheet Size: Maximum 22 x 17 inches.

C. Scale and Spacing: To allow for notations and revisions.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.2 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by Specification section number.

C. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

D. Provide legend for symbols and abbreviations used.

3.3 BAR CHARTS

A. Include a separate bar for each major portion of Work or operation.

B. Identify the first work day of each week.

3.4 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Project Manager at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.5 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Indicate changes required to maintain Date of Substantial Completion.

3.6 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Engineer, Authority, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION

SECTION 01 32 26

CONSTRUCTION PROGRESS REPORTING

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Requirements for submitting reports documenting construction progress.

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 31 19 – Project Meetings.

E. Section 01 32 16 - Construction Progress Schedule.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 SCHEDULE

A. A daily work report shall be prepared and submitted by the site Superintendent recording progress, all pertinent daily events, and status of any ongoing issues.

B. Reports shall be submitted a minimum of one time per week. All daily reports for the week shall be consolidated and submitted no later than noon on the following Monday.

C. More frequent submission may be required during critical times with multiple time critical tasks.

D. Daily reports documenting work that will be concealed shall be submitted prior to covering work. Types of work requiring immediate reporting shall include but not be limited to underground installation, work that will be enclosed within building walls, floors, or roofs, and coating systems requiring multiple coats.

E. Daily reports documenting mandatory tests shall be submitted within 24 hours of test completion. Types of work requiring immediate reporting shall include but not be limited to piping pressure tests and electrical circuit tests.

3.2 CONTENT

Daily reports shall include the following as appropriate:

A. Summary of general tasks relative to construction progress.

B. Weather conditions.

C. A minimum of 4 project photos of the work performed that day unless no new work was performed.

D. Additional photos shall be submitted as required to document work that will be covered or to document mandatory tests.

E. Additional photos shall be submitted if problematic site conditions are encountered that may result in delays or change of conditions.

F. Names and titles of all laborers onsite (daily basis).

G. Regular labor hours worked (daily basis).

H. Overtime hours worked (as encountered and cumulative).

I. Material quantities delivered (daily and cumulative).

J. General material management items (daily and cumulative).

K. Unsuitable quantities hauled offsite (daily and cumulative).

L. Quantities of pay items installed (daily and cumulative).

M. Any construction issues resulting in delays (reported day of, as encountered).

N. Any equipment issues causing delays (reported day of, as encountered).

O. Safety Meetings, topics covered.

P. Safety issues and concerns (reported day of, as encountered).

Q. Disputes (reported day of, as encountered).

R. Any information required or outstanding from the Authority.

S. Items that could require a change order (reported day of, as encountered).

T. Requests for information (reported day of, as encountered).

U. Site characteristics that may warrant a Change In Conditions (reported day of, as encountered).

V. Note of any onsite conversation, or communication, where direction is given to the contractor which could incur an added cost owed to the Contractor. Date, Time and name of individual must be reported (reported day of, as encountered).

3.3 DISTRIBUTION OF REPORTS

A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Engineer, Authority, and other concerned parties.

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 – Application for Payment.

G. Section 01 32 16 - Construction Progress Schedule.

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 Specifications.

N. Operations and Maintenance Manuals.

O. Equipment Installation Data.

1.3 SUBMITTAL TIMELINE

A. The Preliminary Submittal Register shall be provided to the Authority within four (4)) calendar weeks of the contract award.

B. All Submittals for the first project shall be provided to the Authority within eight (8) calendar weeks of the contract award.

C. If Submittals for specific items cannot be provided with 8 weeks the Contractor shall notify the Authority in writing listing the specific item(s) and the proposed date for delivery.

1.4 SUBMITTAL REGISTER

A. Submit preliminary Submittal Register as required by Section 00 70 00 – General Conditions. In addition to manufacturer's data and shop drawing submissions, include all submittals required by the Contract Documents in the Submittal Register

B. Submittal Register shall portray an orderly sequence of submittals, early submittals for long lead-time items, and submittals which require extensive review.

C. Submittal Register shall be reviewed by the Authority and shall be revised and resubmitted until accepted by the Authority.

1.5 SUBMITTAL PREPARATION

A. The Contractor shall prepare all submittals as required by the provisions of Section 00 70 00 – General Conditions, Section 00 80 00 – Supplementary Conditions, the technical specifications, and the drawings.

B. The Contractor shall review submittals for accuracy and completeness prior to submitting.

1.6 SUBMITTAL REQUIREMENTS

A. Unless otherwise directed in these documents or by Authority, provide each submittal as an electronic portable document format (PDF) file, transmitted via email. If file is too large to be received by Authority via email, provide a download link, deliver in portable USB drive, or as otherwise instructed by Authority.

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 Submittal Register.

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.

1.7 RESUBMITTALS

A. 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.

B. 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. The Contractor shall pay all review costs associated with more than 2 reviews.

1.8 AUTHORITY REVIEW

A. The Authority will review submittals and re-submittals, and return submittal comments within **7** 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:

"Approved" – denotes that the submittal is generally consistent with the requirements of the Contract Documents. A resubmittal is not required.

"Approved with 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.

1.9 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

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 – not used

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, and responsibilities of the parties to the Contract, nor those of the 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. International Building Code (IBC).
3. National Fire Protection Association (NFPA) NFPA 30 and NFPA 37.
4. National Electrical Code (NEC).
5. National Electrical Safety Code (NESC)
6. Alaska Department of Commerce, Community and Economic Development (DCCED) 12 AAC 32
7. Alaska Department of Commerce, Community and Economic Development (DCCED 12 AAC 39
8. American Society of Testing and Materials (ASTM).
9. Occupational Safety and Health Administration (OSHA) 29 CFR 1910.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 43 10

CONTRACTOR QUALIFICATIONS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Contractor's technical qualifications to be able to execute the Work in accordance with the Contract Documents.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 – General Conditions.

B. Section 01 33 00 – Submittal Procedures.

C. Section 01 45 00 - Quality Control.

D. Technical Specifications: Contractor and Fabricator Qualifications.

1.3 SUBMITTALS

A. As part of the Submittal process submit evidence of qualifications as required by this section and the Technical Specifications.

B. The subcontractor list shall designate the party responsible for the portion of Work requiring specific qualifications.

1.4 CONTRACTOR QUALIFICATIONS - GENERAL REQUIREMENTS

A. The Contractor shall meet all technical requirements of the Contract Documents. The Contractor may use sub-contractors as required to meet the requirements. The Authority may request documentation of all required qualifications after the bid opening and prior to award in order to verify Contractor qualifications.

1.5 CONTRACTOR QUALIFICATIONS - SPECIFIC REQUIREMENTS

A. In accordance with Alaska statues and regulations, all Electrical work falling under the scope of 12 AAC 32.165 shall be performed under the supervision of an Electrical Administrator with a current license in the State of Alaska in the Unlimited Commercial Wiring Category.

B. Fabricators for the switchgear and Developers for the SCADA system shall meet the minimum requirements of the technical specifications for that item.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 45 00

QUALITY CONTROL

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Contractor's quality assurance program and control procedures for executing the Work.

1.2 RELATED REQUIREMENTS

A. Section 00 70 00 – General Conditions.

B. Section 01 33 00 – Submittal Procedures.

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

D. Section 01 42 19 – Reference Standards.

E. Section 01 43 10 - Contractor Qualifications.

F. Section 01 60 00 – Material and Equipment.

G. Technical Specifications: Testing and Reporting requirements.

1.3 TEST FORMS

A. The Contractor shall provide forms for all test required by the Technical Specifications. Tests forms shall include but not be limited to phase rotation, continuity and insulation, etc.

B. Upon request the Authority can provide the Contractor forms for common tests.

1.4 GENERAL

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. Specific Quality Control requirements are included in the Technical Specifications. General Quality Control requirements entail ensuring that all aspects of the Work conform to the technical requirements of the Contract Documents.

E. 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.

1.5 JOB CONDITIONS

A. Where Specifications require work to be field-tested, timely notice of its readiness for inspection and testing shall be provided to the Authority. The Authority shall have the right to witness all tests. Photos shall be taken to document all tests. Work shall be concealed only upon approval by the Authority.

B. The results of tests are for use by the Authority to evaluate the acceptability of Work 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.

C. Maintain quality control over sub-contractors, 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.

D. Upon failure of Work which has been tested or inspected, previous acceptance may be withdrawn and Work be subject to removal and replacement with Work in accordance with the Contract Documents, at no cost to the Authority.

1.6 MANUFACTURER'S FIELD SERVICES

A. Required when technical specifications require the manufacturer or fabricator to provide qualified personnel to observe field conditions, installation, quality of workmanship, and to start, test, and adjust equipment as applicable.

B. Submit to the Authority the manufacturer or fabricator representative's written reports containing observations and recommendations within one (1) calendar week of manufacturer's field services.

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.

3.2 QUALITY CONTROL

A. The Contractor shall establish the methodology to perform the Contractor's inspection and tests of all items including that of its subcontractors. The Contractor 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 Contractor shall ensure quality for all construction work performed under this Contract,

including assigned subcontract work. The Contractor shall specifically include surveillance and tests required in the technical specifications.

B. The Contractor shall coordinate all work requiring Special Inspection, where specified, to ensure full access by Special Inspectors and Quality Assurance testing personnel.

C. The Contractor shall provide, 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 shall have and follow a 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) or Design Clarification Verifications (DCVR'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.

4. Non-Conformance Procedure: Contractor shall have and follow a 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 re-inspection.

B. The Contractor shall maintain the following Quality Control records and reports and shall submit to the Authority as required:

1. The Contractor shall fill out test reports immediately upon completion of each test. Test reports shall be signed and dated and shall include adequate photographs to document test procedure and conditions. Test reports shall be submitted with the daily report for the day of testing.

2. Inspection Logs: The Contractor shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations. The Inspection 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. The Inspection Log shall be available for review by the Authority upon request.

3. Immediate Notification of Deficiencies: Contractor shall provide immediate notification to the Authority whenever a failed or nonconforming test or inspection occurs. This immediate notification shall be followed up with a written report describing the deficiency and a correction plan.

3.4 ORGANIZATION

A. 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 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 ensures 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. Provide and pay for temporary electrical service including required equipment.

B. Provide lighting for construction operations.

C. Provide additional lighting for inspections if requested by Authority or Engineer.

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; for freeze protection; and to protect equipment, 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. Provide and pay for temporary water service as required.

1.7 TEMPORARY SANITARY FACILITIES

A. Provide and pay for required sanitary facilities and enclosures.

1.8 TEMPORARY TELEPHONE AND INTERNET SERVICE

A. Provide and pay for telephone and internet service to the project site and/or Contractor field offices. Note that in addition to Contractor's needs there may be additional telephone and internet service requirements for testing, commissioning, and operation of the power plant. See Section 01 11 13 Summary of Work.

1.9 FREEZE PROTECTION

A. Provide freeze protection for temporary water service piping, batteries, switchgear, control panels, and other components potentially subject to harm.

1.10 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.

1.11 SECURITY

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

1.12 REMOVAL OF UTILITIES AND FACILITIES

A. Unless required for testing, remove Temporary Construction Facilities, Services, Utilities, and other related items prior to Substantial Completion inspection.

B. Clean and repair damage caused by installation or use of Temporary Construction Facilities.

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.

1.13 COST RESPONSIBILITY

A. Unless specifically noted otherwise, the cost of Temporary 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 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, mechanical and 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 28 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 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 the Authority.

4. Waives claims for additional costs or time extension, which may subsequently become apparent from indirect costs.

5. Will reimburse the 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)	ALASKA ENERGY AUTHORITY

Project: Term Contract for 2024 M&I Switchgear Upgrade Projects Project No.: 25002

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 Authority.
❑	❑	The cost of any license fee or royalty necessitated by the proposed substitution will be paid by the Contractor at no cost to the Authority.

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

❑ Accepted
❑ Rejected

_____ Date: _____
Project Manager

SECTION 01 71 13
MOBILIZATION AND DEMOBILIZATION

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Requirements for mobilization and demobilization.

1.2 RELATED REQUIREMENTS

A. Section 01 11 13 – Summary of Work.

B. Section 01 29 73 – Schedule of Values.

C. Section 01 29 76 – Application for Payment.

D. Section 01 51 00 – Construction Facilities.

E. Section 01 77 00 – Contract Closeout Procedures.

1.3 DEFINITIONS

A. Mobilization and Demobilization includes:

1. Travel to the project site of all personnel, including sub-contractors, and return upon completion of the Work.

2. Delivery to the Site of all construction equipment, tools, supplies, temporary facilities, etc. ready for commencing and prosecuting the Work, and the subsequent removal from the site upon completion of the Work.

3. Delivery to the Site of all required project materials. Removal of any leftover materials from the site upon completion of the Work. Note that with agreement of the Authority, leftover materials may be left on the project site if placed in a neat and orderly fashion at a location approved by the Authority.

4. The preparation of the Contractor's work area; the complete assembly of equipment necessary to perform the required work; and all other preparatory work required to permit commencement of the actual Work.

1.4 REQUIREMENTS

A. Haul routes, staging areas, and equipment positioning at the project site will be subject to approval by the Authority, who will coordinate with Contractor to determine requirements and locations.

B. Cooperate with the Authority in allocation and use of Mobilization and Demobilization areas of Site, field offices and sheds, materials storage, traffic, and parking facilities.

C. During construction, coordinate use of Site and facilities through the Authority.

D. Comply with Authority's procedures of contract communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

E. Comply with instructions of the Authority for use of utilities and construction facilities.

F. Coordinate field engineering and layout Work under instructions of the Authority.

G. Walk through Site with the Authority prior to start of Work.

1.5 SUBMITTALS

A. Refer to Section 01 33 00 – Submittal Procedures, for submittal requirements.

B. If requested by the authority, submit a plan of the proposed layout of the construction site, including equipment, access ways, temporary facilities, staging, and storage areas, within eight (8) calendar weeks after Notice to Proceed.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Delivery to the jobsite of construction tools, equipment, materials, and supplies shall be accomplished in conformance with applicable ordinances, regulations, and the requirements of the Contract Documents.

B. Upon completion of the Work, remove construction tools, apparatus, equipment, unused materials and supplies, and personnel from the jobsite.

END OF SECTION

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.

G. Section 01 74 00 – Cleaning and Waste Management.

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 Authority.

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 Authority to determine defect type.
3. Surface corrosion exceeding five percent (5%) of the surface area shall be considered a structural defect.

H. Defects shall be repaired or replaced 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 Authority.

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 and tripping hazards. 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 the 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. Provide Operation and Maintenance Manuals for the switchgear as described in the Technical Specifications.

B. Unless otherwise directed in these documents or by the Authority, provide each submittal as an electronic portable document format (PDF) file, transmitted via email. If file is too large to be received by the Authority via email, provide a download link, deliver in portable USB drive, or as otherwise instructed by the Authority

1.9 TRAINING

A. Before Substantial Completion, instruct the local operator(s) and Authority's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times.

1.10 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Provide spare parts, maintenance, and extra products in quantities specified in the Technical Specifications. These shall be labeled and stored per manufacturer's recommendations and as specified.

B. Deliver to Project site and place in location as directed; obtain receipt prior to Substantial Completion payment.

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.

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.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 74 00

CLEANING AND WASTE MANAGEMENT

PART 1 – GENERAL

1.1 GENERAL

A. During the term of this Contract, the Contractor shall remove as promptly as possible any materials and equipment which are not required for the completion of the Work. All debris shall be removed from the site and disposed of daily. The Contractor shall take particular care to eliminate any hazards created by these operations.

B. All cleaning shall be performed to the satisfaction of and at no additional cost to the Authority.

1.2 RELATED REQUIREMENTS

A. Section 01 73 00 – Execution Requirements.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 PROGRESS CLEANING

A. At the completion of the project, or prior thereto if so directed by the Authority, the Contractor shall be responsible for completely cleaning those portions of the project which his work affects.

B. Contractor shall remove from the facility all tools, equipment, surplus materials, temporary structures, and other material not incorporated in the permanent installation.

C. Restoration of Damaged Property: To the extent that any roads, vegetation, structures, utilities, or other items are damaged or displaced by the Contractor's operations, these shall be restored to their original or better condition prior to Substantial Completion inspection. This shall include both on-site and off-site items. Any damage which is severe enough to disrupt community travel or utilities shall be repaired by the Contractor immediately.

D. General cleaning and restoration must be accomplished prior to Substantial Completion.

E. Final cleaning and restoration must be accomplished prior to Final Completion.

F. Disposal of hazardous and construction materials shall be accomplished as specified in Section 00 70 00 – General Conditions and this Section.

3.2 WASTE DISPOSAL

A. Salvaged Material: All salvaged items not being reinstalled shall be turned over to the Authority or Utility as indicated in the Drawings.

B. General Construction Waste: Waste generated during the process of completing the project scope of work shall be removed from the limits of the project site and

disposed of. All general construction waste shall be disposed of as required by local, state and federal laws, rules, regulations and requirements.

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, 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

A. The following items must be submitted to the Authority prior to requesting the Substantial Completion Inspection:

1. All test reports.
2. Project Record Documents.
3. Operation and Maintenance Data.
4. Warranties and Bonds.
5. Any required certificates of inspection.

B. The following items must be available at the project site prior to requesting the Substantial Completion Inspection:

1. Spare Parts and Maintenance Materials.
2. Keys.

C. 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, see Section 01 77 00A - 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 five (5) calendar days in advance of the Substantial Completion inspection date.
2. Pre-Commissioning Substantial Completion Inspection Checklist is submitted, see Section 01 11 13 – Summary of Work. Note on the checklist any known items needing to be completed or corrected.
3. All equipment and systems have been tested, adjusted, are properly operating and fully functional.
4. All automated and manual controls are fully operational and the entire system is ready for commissioning.

B. When all of the preceding requirements for the consideration of Substantial Completion have been met, the Authority and/or their designee will conduct a scheduled Substantial Completion inspection. If upon the completion of the inspection, the Authority should find that the Work is not substantially complete, the Authority will promptly notify the 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 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. The Authority reserves the right to review photographic documentation in lieu of on-site inspection.

E. 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 AND PAYMENT

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 or maintenance materials.
5. Contractor's certification of insurance.
6. Submittals and miscellaneous registers.
7. Original final pay estimate.
8. Contractor's release.
9. Department of Labor Notice of Completion (NOC).
10. 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. The 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 will make final payment and issue a letter of Final Acceptance.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

ALASKA ENERGY AUTHORITY

CERTIFICATE OF SUBSTANTIAL COMPLETION

Project: Term Contract for 2024 M&I Switchgear Upgrade Projects

A/E Project Number:

To:

Community:

Contract Number:

From: Alaska Energy Authority

Contract Date:

The work performed under this contract has been reviewed and found to be substantially complete. The date of substantial completion of the project or portion thereof designated above is hereby established as _____ which is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below.

Definition of Date of Substantial Completion

The Date of Substantial Completion of the Work or designated portion thereof is the date certified by the Project Manager when construction is sufficiently complete in accordance with the Contract Documents, so the _____ can occupy or utilize the work or designated portion thereof for the use for which it is intended, as expressed in the Contract Documents.

A list of items to be completed or corrected, prepared by the Project Manager is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all work associated with the Contract Documents.

The date of commencement of warranties for items on the attached list will be the date of final payment unless otherwise agreed to in writing.

☐ Attachments:

Alaska Energy Authority: **Date**:

Project Manager

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Maintenance of Record Documents.

B. Submittal of Record Documents.

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.

E. Section 01 77 00 – Contract Closeout Procedures.

F. Technical Specifications: Manufacturer's certificates and certificates of inspection.

1.3 MAINTENANCE OF RECORD DOCUMENTS

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 and product data.
6. Field test records.
7. Inspection certificates.
8. Manufacturer's certificates.

B. Prior to Substantial Completion, provide original or legible copies of each item maintained by the Contractor.

C. Delegate responsibility for management of maintenance of Record Documents to one person on the Contractor's staff as approved in advance by the Authority.

D. Promptly following award of Contract, secure from the 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 the Authority.

J. Do not use job set for any purpose except entry of new data and for review and copying by the Authority.

K. Keep record documents and samples available for inspection by the Authority.

L. 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.

M. Prior to submitting request for Final Payment, obtain the Authority's approval of final Record Documents.

1.4 RECORDING

A. Record information on a set of ‘black-line’ opaque Drawings, and in a copy of a Project manual, provided by the 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 locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.

2. Field changes of dimension and detail.

3. Changes made by modifications.

4. Details not on original Contract Drawings.

5. References to related Shop Drawings and modifications.

6. 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 SUBMITTAL OF RECORD DOCUMENTS

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. The 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 the 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 26 05 02

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 – GENERAL

1.1 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.

1.2 RELATED REQUIREMENTS

A. This section applies to all Division 26 work.

1.3 COORDINATION

A. Layout all the work in advance and avoid conflict with other Work in progress. Physical dimensions shall be determined from Drawings and field measurements. Verify locations for junction boxes, disconnect switches, stub-ups, etc., for connection to equipment furnished by others, or in other Divisions of this Work.

1.4 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.

1.5 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

2.1 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 equivalent independent testing laboratory.

C. 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 shall be subject to review for adequacy and compliance with Contract Documents.

2.2 PRODUCTS FURNISHED IN OTHER DIVISIONS – not used

2.3 IDENTIFICATION

A. Equipment Nameplates:

1. Provide rigid engraved nameplates of laminated plastic 1/16-inch thick with white letters on a black or gray background. Nameplates for emergency equipment shall be red with white letters.

   a. Securely attach nameplates with two screws, minimum.

   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. 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 Drawings, 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. Conduit Labeling: Unless a conduit is completely exposed and the purpose is clearly obvious, all conduits shall be permanently marked using a label maker.

1. Conduits Entering Panels: All conduits entering panels shall be labeled with the circuit numbers of the circuits contained inside.

2. Concealed Conduits: Conduits that are concealed inside building structure or below grade shall be marked at each with the designation of the opposite end.

3. For interior conduits the label shall be applied directly to the conduit. For exterior conduits the label shall be applied inside the junction box or conduit body where the conduit terminates.

D. Junction Boxes: All junction boxes with steel covers shall be permanently marked using a label maker with the circuit numbers of wiring inside. For interior locations the label shall be applied on the outside and for exterior locations the label shall be applied inside the junction box.

E. Conductors:

1. Conductors shall be color coded as indicated on the Electrical Conductor Schedule on the Drawings.

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 or panel Fabricator. 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

3.1 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.

3.2 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.

3.3 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. Installation of all equipment shall be in accordance with manufacturer's instructions.

3.4 SUPPORT SYSTEMS

A. All interior materials used shall be galvanized or zinc plated.

B. All exterior materials used shall be hot dip galvanized. Where support elements are field cut, exposed metal shall be coated with spray-on cold galvanizing.

C. Support from structure or as specifically detailed on the Drawings.

3.5 MOUNTING HEIGHTS – not used

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.

3.6 CUTTING AND PATCHING

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 in a neat and workmanlike manner 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

3.7 FLASHING AND SEALING

A. Seal all interior and exterior wall penetrations with polyurethane caulking. Seal both sides of walls where accessible.

3.8 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 installed in exterior locations.

3.9 CLEAN-UP AND COMMISSIONING

A. Throughout the Work, the Contractor shall keep the work area neat and orderly by periodic clean-ups.

B. As independent parts of the installation are completed, they may be placed in service and utilized during construction.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.1 SCOPE OF WORK

A. This section describes general requirements, products, and methods of execution relating to the furnishing and installation of a complete grounding system as required for this project.

1.2 RELATED REQUIREMENTS

A. Section 26 05 00 Common Work Results for Electrical.

B. Section 26 05 02 Basic Materials and Methods.

1.3 MINIMUM REQUIREMENTS

A. The minimum requirement for the system shall conform to Article 250 of the NEC.

1.4 SUBMITTALS

A. Product Data: Provide in accordance with Section 26 05 00 Common Work Results for Electrical and Division 1.

PART 2 – PRODUCTS

2.1 GENERAL

A. Install types indicated and of sizes and ratings to comply with NEC. Where types, sizes, ratings, and quantities indicated are in excess of NEC requirements, the more stringent requirements and the greater size, rating, and quantity indications shall govern.

B. Material: Copper only. Aluminum is not acceptable for use in any location.

2.2 GROUNDING ELECTRODES – not used

2.3 WIRE AND CABLE CONDUCTORS

A. Ground Grid or Grounding Electrode Conductors shall be bare copper conductors conforming to the following:

1. Solid Conductors: ASTM B-3.
2. Stranded Conductors: ASTM B-8.
3. Tinned Conductors: ASTM B-33.

B. Station Service Circuit Grounding Conductor: General use conductors in accordance with the conductor schedule, green insulated. Minimum No. 12 AWG.

C. Generator and Feeder Circuit Grounding Conductor: Equivalent to the phase conductors in accordance with the conductor schedule, size as indicated.

2.4 MISCELLANEOUS CONDUCTORS

A. Ground Bus: Bare annealed copper bars of rectangular cross section.

B. Braided Bonding Jumpers: Copper tape, braided No. 30 gauge bare copper wire, terminated with copper ferrules.

C. Bonding Strap Conductor/Connectors: Soft copper, 0.05-inch-thick and 2 inches wide, except as indicated

2.5 GROUND CONNECTIONS

A. Grounding conductor connections to building structure and to equipment skids shall be made with mechanical lugs or compression lugs as indicated. Drill and tap steel structure and equipment and fasten with stainless steel bolts for positive bond to clean bare steel threads.

PART 3 – EXECUTION

3.1 SERVICE AND STRUCTURE GROUND

A. Create a Grounding Electrode System (GES) for this project by connecting the following:

1. Generators, switchgear, and transformers.
2. Equipment skids and building structure as shown on the Drawings.
3. The neutral conductors grounded only where specifically indicated on the Drawings.

B. Current carrying capacity of the grounding and bonding conductors shall be in conformity with Tables 250.66 and 250.122 of the NEC.

3.2 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 Drawings, 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 minimum #6 AWG copper cable.

END OF SECTION

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.1 SCOPE OF WORK

A. Support and align raceways, cabinets, boxes, fixtures, etc., in an approved manner and as specified.

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. Shop Drawings and Product Data: Provide in accordance with Section 26 05 00 Common Work Results for Electrical and Division 1.

PART 2 – PRODUCTS

2.1 HANGERS AND SUPPORTS

A. Support equipment and raceways on strut, brackets, trapeze hangers, or as detailed. Anvil, B-Line, Grinnell, Unistrut, or approved equal.

2.2 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 approved equal.

C. Double Strut: 12 gauge thick steel, 1-5/8” x 3-1/4”, B-line B22A-SH-Galv or approved equal.

D. Shallow Strut: 14 gauge thick steel, 1-5/8” x 13/16”, B-line B54-SH-Galv or approved equal.

2.3 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. Zinc plated carbon steel except for exterior installations provide hot dip galvanized

2.4 FASTENERS

A. All bolts, nuts, and washers to be zinc plated carbon steel except as specifically noted otherwise.

B. On exterior installations provide hot dip galvanized steel bolts, nuts, and washers.

C. Hanger Rods: Continuous threaded rod. Zinc plated carbon steel except for exterior installations provide hot dip galvanized.

D. Provide stainless wood screws and sheet metal screws where specifically indicated on the Drawings.

2.5 EARTHQUAKE ANCHORAGE – not used

PART 3 – EXECUTION

3.1 INSTALLATION

A. Conduits and equipment shall be mounted using strut or similar supports unless otherwise noted.

B. Support material shall be cut square and smooth using a floor mounted bandsaw or chop saw. Hacksaws shall not be used to cut support material.

C. Do not strap conduits to piping except where specifically detailed on the Drawings. 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.

D. Conduits shown to be run at grade shall be supported by 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.

END OF SECTION

SECTION 26 05 33

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.1 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 Drawings, required by Code and specified in these specifications.

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 26 Grounding and Bonding for Electrical Systems.

D. Section 26 05 29 - Hangers and Supports for Electrical Systems.

1.3 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.

1.4 SUBMITTALS

A. Shop Drawings and Product Data: Provide in accordance with Section 26 05 00 Common Work Results for Electrical and Division 1.

PART 2 – PRODUCTS

2.1 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.

2.2 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.

2.3 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.

2.4 WIREWAY

A. Interior Use: UL listed; NEMA 1, enamel finished; hinged covers except where specifically indicated screw cover. Furnish complete with all fittings, couplings, and accessories; Hoffman, B-Line, or approved equal.

2.5 FITTINGS

A. Conduit bodies shall be factory made with threaded hub connections and weather tight screw type covers. For all exterior locations provide malleable iron conduit bodies with hot dipped galvanized finish.

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.

2.6 JUNCTION BOXES AND ENCLOSURES

A. Metallic device/junction boxes for interior use with Electrical Metallic Tubing (EMT) shall be minimum .0625” thick SAE 1008 pressed steel with galvanized finish, 2-1/8” deep welded or drawn construction with 1/2” and 3/4” knockouts. Provide with 1/2” raised face metal covers.

B. For interior electrical junction boxes larger than 4” square provide NEMA 1 steel wall mount screw cover enclosures. Minimum 12-gauge steel with color ANSI 61 gray powder coated finish. Hoffman, B-Line, or approved equal. Provide with plated or stainless-steel cover screws.

C. Weatherproof gang boxes for exterior use and where specifically indicated shall be die cast zinc metal with powder coated finish and threaded hubs. Provide with matching weatherproof gasketed covers and mounting hardware.

PART 3 – EXECUTION

3.1 CONDUIT USAGE

A. INTERIOR - All interior locations shall be electrical metallic tubing (EMT) except where specifically indicated as wireway or GRC.

B. EXTERIOR - All exterior above grade locations shall be galvanized rigid conduit (GRC).

C. Liquidtight flexible metal conduit shall be used in lengths of 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.

3.2 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. Provide seal off fittings when crossing hazardous boundaries into non-hazardous locations and at enclosures where required by Code. Not all locations where these fittings are required are shown.

G. 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.

H. 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.

I. 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 and junction boxes shall be permanently labeled in accordance with Section 26 05 02.

L. 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 09 00

INSTRUMENTATION AND CONTROL DEVICES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Instrumentation Equipment
2. Pressure gauges.
3. Differential Pressure gauges.
4. Thermometers and Thermowells.

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 23 02 - Upgrade Existing Prime Power Switchgear.

1.3 SUBMITTALS

A. Provide submittals for all products and systems under this Section in accordance with Section 26 05 00 - Common Work Results for Electrical and Division 1.

B. Product Data: Submit manufacturers catalog literature for all instrumentation items specified herein.

1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section.

B. Installer: Company specializing in performing Work of this section.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Accept controls on site in original factory packaging. Inspect for damage.

1.6 COORDINATION

A. Coordinate installation of control components with work of Division 26.

PART 2 PRODUCTS

2.1 AIR RESTRICTION INDICATOR/SWITCH

A. Combination visual indication and alarm switch. 1/8” MPT, 22.46” water column limit, manual reset, normally open switch with adjustable setpoint. Donaldson 135578-08420 or approved equal. Adjust switch to close at 20” water column and verify function.

2.2 EXHAUST GAS TEMPERATURE SENSOR

A. High temperature (650°C) 2 wire 100 ohm RTD with 2' high temperature lead wire, spring strain relief, Deutsch DT06-2S-E008 male connector, Deutsch DT04-2P-E008 female connector, and compression fitting with 1/4" MPT adapter. Eustis RGB7B203B02X0 with NS44 adapter or approved equal.

2.3 J1939 INPUT FOR MECHANICALLY GOVERENED ENGINES

A. Configurable Input/Output Module. Converts analog and digital I/O's to J1939. 8-24VDC input, CAN J1939 port, 4 digital inputs, 2 digital outputs, Type K and J thermocouple input, 2 analog inputs (battery voltage and configurable 0-5VDC or 4-20mA), and Magnetic Pick-up input for speed sensing. Murphy, XM500 P/N: 78700420 or approved equal.

B. Oil Pressure Sending Unit. 1/8" NPT connection, 0-100 psi, 2-wire ungrounded. Murphy ES2P-100 P/N: 05701858 or approved equal. Connect to XM500 Pin1-Grey.

Temperature Sending Unit. 1/2" NPT connection, 2-wire ungrounded. Murphy ES2T-250-1/2 P/N: 10702013 or approved equal. Connect to XM500 Pin4-Grey. Include optional terminal boot.

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 systems to be controlled are ready to operate.

3.2 INSTALLATION

A. Install instrumentation in appropriate locations on engines in accordance with manufacturer's installation instructions.

3.3 TESTING AND CALIBRATION

A. Verify proper function through SCADA system and adjust scaling and offset as required.

END OF SECTION

LIST OF ABBREVIATIONS

CAC:	Charger Air Cooler
CPU:	Central Processor Unit
CPT:	Control Power Transformer
CT:	Current Transformer
ECU:	Engine Control Unit
EULA:	End User License Agreement
FPR:	Feeder Protection Relay
GC:	Genset Controller (new)
GCP:	Genset Control Package (old Woodward GCP)
GPH:	Gallons per Hour
GPR:	Generator Protective Relay
HMI:	Human Machine Interface (referred to as OIU)
I/O:	Input/Output
kWh:	kilowatt hour
LAN:	Local Area Network
O&M:	Operations & Maintenance
OIU:	Operator Interface Unit
PLC:	Programmable Logic Controller
PT:	Potential Transformer
PSI:	Pounds per Square Inch
RPM:	Revolutions per Minute
RTD:	Resistance Temperature Detector
SCADA:	Supervisory Control and Data Acquisition
SMS:	System Mode Switch
UL:	Underwriters Laboratory
UPS:	Uninterruptible Power Supply
VAC:	Volts, AC
VDC:	Volts, DC
VFD:	Variable Frequency Drive

SECTION 26 23 02

UPGRADE EXISTING PRIME POWER SWITCHGEAR

PART 1 - GENERAL

□.□ SCOPE

A. The Work shall consist of, but not be limited to, designing, fabricating, testing and providing complete control system upgrades to existing prime power parallel diesel generation switchgear as indicated on the project design drawings and as specified herein.

B. The specifications and project design drawings are complementary. What is shown on one is binding whether or not it is shown or specified in the other.

C. The project design drawings consist of manufacturer's original switchgear shop drawings plus example drawings of prior completed upgrade projects similar to this work.

D. Provide a complete and operational system as specified herein. The components identified shall not be construed to be the complete list of components required for the successful operation of the system as specified, nor are all components identified required on all systems. Provide all components and design required for the complete and successful operation of the system, conforming to all the requirements specified herein, whether the components are identified or not. Ensure all devices are installed and operate within their intended purposes. Check all catalog numbers indicated and coordinate all devices installed.

E. The word "Fabricator" as used in this section shall mean the company responsible for assembly, wiring, and programming of control equipment and systems.

F. The word "Contractor" as used in this section shall mean the Electrical Contractor responsible for field installation, testing, and commissioning of the system. .

G. The upgraded paralleling switchgear shall be capable of unattended automatic and manual operation as described herein. The switchgear controls shall be a fully coordinated system that provides the functions and features as specified herein.

H. The automatic control and overall sequencing, starting, and stopping of the generators (Demand Control) shall be performed by a Programmable Logic Controller (PLC). Failure of the PLC shall not inhibit manual operation, paralleling, and control of the individual engine generators.

I. Automatic start/stop shall be accomplished through the Genset Controllers (GC). Each generator has either an existing electrically operated contactor or electrically operated circuit breaker to perform the normal online/offline paralleling functions of the generator which will be controlled by the GC. A generator with an electrically operated contactor also has a molded case circuit breaker for equipment and conductor protection.

J. The distribution feeder has either an existing electrically operated contactor or electrically operated circuit breaker to perform the normal online/offline

functions. A distribution feeder with an electrically operated contactor also has a molded case circuit breaker for equipment and conductor protection. Note some feeders are equipped with a feeder protection relay.

K. The Contractor shall fully test the upgraded switchgear as specified herein.

L. The Fabricator shall provide an additional four (4) hours of programming assistance and technical support for each community to modify the system programming as requested by the Authority or its Designee(s). These hours are in addition to any technical requirements specified for programming, start-up, and commissioning efforts, and shall be included in the Fabricator's bid price. The programming assistance and technical support may be required to be provided at a single event or may be spread out over the year as directed by the Authority or its Designee(s), and will be performed remotely from the Fabricator's office and not at the Utility location.

□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 23 05 – SCADA System for Switchgear Upgrades

□3 SUBMITTALS

A. Provide in accordance with Section 26 05 00 Common Work Results for Electrical and Division 1.

B. Provide a bill of material for all equipment or material provided as part of the switchgear.

C. Provide manufacturer's catalog literature for all accessories and equipment. Literature shall be limited to only the items furnished and shall not include entire sections of catalogs or data sheets for items not used. Items shall be marked electronically such that it is clear which item is for what purpose.

D. Provide complete and accurate shop drawings of the equipment as specified herein. The current revision, issue number, and date shall be indicated on all drawings and other descriptive data. Provide all drawing files in Adobe PDF format. Upon request, provide drawing files in AutoCAD 2016 format; include all title blocks, external references, special fonts, and plot configuration files such that when plotted the AutoCAD file appears like the PDF file.

1. All drawings submitted shall be drawn to accurate scale on sheets not less than 11" x 17"; except for actual pattern or template type drawings, the maximum sheet size shall not exceed 24" x 36". The preferable sheet size is 22" x 34". Indicate the name of the firm that prepared each shop drawing and provide appropriate project identification in the title block. Do not reproduce contract documents or copy standard printed information as the basis of shop drawings.

2. All drawings shall use standard ANSI symbols.

3. Provide dimensioned drawings showing the locations of all major face mounted devices such as meters, GC, OIU, and FPR, etc.

4. Provide internal wiring and connection diagrams for each section of the switchgear, a one-line diagram, and three-line diagrams based on the existing switchgear drawings. The one-line diagram shall show all breakers, including frame size and trip setting; CT's, CPT's, and PT's; protective devices; meters; control devices; and the size and temperature rating of all power conductors where provided on the project design drawings. The three-line diagrams shall show additional detail including wire terminations, CT shorting terminals, etc.

5. Provide schematics of all controls. Provide AC three line and DC control schematic diagrams for each generator, master, feeder, and VFD. Provide feeder and generator breaker control schematic diagram. Provide 24VDC control power schematic diagrams. Provide 120VAC control power, utility power convenience receptacle, and fan control schematic diagram. Schematics shall be in ladder diagram format and shall show all control devices, and wire and external terminal block numbers.

6. Provide a PLC communication network schematic diagram showing all buses, devices, and expansion block cables. Identify device location in switchgear.

7. Provide a communication network (LAN) schematic diagram showing all switches, meters, GC's, OIU, FPR, VFDs, Data Storage Server, PLC, and external I/O devices. Identify device location in switchgear. Include IP Address for all devices.

8. Provide a communication network schematic diagram showing CANbus connection to GC's, and J1939 connection to IKD-1 digital I/O expansion modules and engine ECU's. Identify device location in switchgear.

9. Provide drawings showing terminal block layouts and interconnecting wiring. The drawings shall show the physical layout of the terminal blocks with their appropriate designations and all connections between terminal blocks, auxiliary switch contacts, control devices, instrumentation, protection devices, etc.

10. Provide drawings of control switches showing all terminals with numbers, including terminals not used. Identify the use of the terminals.

11. Provide drawings that show annunciator layouts and nameplate engraving.

12. Provide the following PLC information: a complete ladder diagram showing all address numbers, rung reference numbers, and all preset register values. Include detailed narrative describing the purpose of each rung. Provide complete tables or schedules listing all utilized I/O addresses, internal relay addresses, and timer, counter, and register addresses and values. Include the latest revision date.

E. Provide proposed settings for review for each GC as specified in the sections that follow.

□4 QUALITY ASSURANCE

A. Equipment provided under this section shall not have been in service any time prior to delivery, except as required by testing.

B. 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 or equivalent standards exist for components, devices, and/or assemblies, such standards shall apply.

C. Perform all work with skilled craftsman specializing in said work. Install all materials in a neat, orderly, and secure fashion as required by the specifications and commonly recognized standards of good workmanship.

D. The existing switchgear is listed and labeled as an assembly under UL 891 or equivalent independent testing laboratory standard recognized by the State of Alaska. All work shall comply with the requirements of the National Electrical Code for Essential Electrical Systems and shall also comply with applicable standards of NEC, ANSI, IEEE and NEMA.

E. The upgraded switchgear shall also be designed, assembled and tested in strict accordance with UL 891 Standard For Switchboards and UL 508A Standard For Industrial Control Panels or equivalent.

□5 FABRICATOR QUALIFICATIONS

A. The switchgear upgrades shall be designed, assembled, and tested by a qualified fabricator (Fabricator) who is regularly engaged in the business of providing generation switchgear. 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 to verify Fabricator qualifications. The list shall include installation date, description of installation, and a reference contact for each installation.

B. At the time of bid submittal, the Fabricator shall have current authorization from a third-party listing agency to provide listed control panels and/or switchboards. Evidence of authorization may be requested by the Authority after the bid opening to verify Fabricator qualifications.

□6 FABRICATOR WARRANTIES

A. The Fabricator shall warrant the work for a period of not less than one-year. The warranty period shall commence upon acceptance by AEA of field testing with the engine generators and final commissioning of the equipment.

B. In the event of a failure of equipment or components or a failure of the system to perform all specified functions during the warranty period, the Fabricator shall repair or replace such defective equipment or components and revise programming and settings as required to achieve full system function. The Fabricator shall assist the Authority as directed to determine the cause of failure and pursue manufacturer's warranties to the extent necessary to obtain replacement equipment and provide proof of action taken upon request.

□7 OPERATION AND MAINTENANCE MANUALS

A. Provide operation and maintenance (O&M) manuals for all new equipment provided under this contract.

B. The O&M 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.

C. The O&M manuals shall include at a minimum the following information:

1. Sequence of operation of the switchgear system.
2. Documentation and operating description of SCADA system.
3. A complete tag list of all input/output devices including, but not limited to, the PLC, GC, and all monitored and controlled devices.
4. Bill of material for all equipment or material provided as part of the switchgear as previously indicated under Submittals.
5. Manufacturer's catalog literature for all accessories and equipment as previously indicated under Submittals.
6. Complete shop drawings as previously indicated under Submittals, revised to reflect as-built conditions of final construction.
7. Complete test reports documenting all shop tests performed in accordance with requirements of Part 3.

D. The O&M manuals shall consist of a single Adobe Acrobat PDF file and shall be complete with all revisions and as-built data to reflect the actual equipment and material installed. The O&M manual shall be organized as follows:

1. Provide chapters to separate the different components into logical groupings, i.e. sequence of operation, warranty, bill of material, breakers, enclosures, battery system, meters, etc. At the beginning of each chapter, provide a page with the chapter number.
2. Provide subchapters for each individual switchgear item. Bookmark each chapter and subchapter such that each component can be navigated to directly from the bookmark.
3. Near the front of the PDF file, provide the Bill of Material organized so that each item is identified with the chapter or subchapter where the documentation is located.
4. At the end of the PDF file, provide all drawings, inserted horizontally. Provide a chapter for the drawings and individually bookmark each drawing.

E. Email download link for the final O&M file to the Authority and provide a copy to the Authority on a USB thumb drive.

PART 2 - PRODUCTS AND ASSEMBLY

2.□ GENERAL

A. All equipment and material furnished shall be new. Equipment furnished and installed under this section shall be fabricated and assembled in full conformity with the project design drawings, specifications, engineering data, manufacturer's instructions, and applicable standards.

2.2 ACCEPTABLE MANUFACTURERS OF SWITCHGEAR COMPONENTS

A. 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 Authority's approval. To obtain approval, submittals shall clearly demonstrate how substitute item meets or exceeds specified item quality and performance characteristics and also complies with electrical connections and physical layout requirements.

B. The following products are specified by brand and part number to maintain commonality for programming and service with similar switchgear used in other rural Alaskan communities. Substitutes will not be allowed for the following components:

1. Programmable Logic Controller (PLC): Allen-Bradley.
2. Genset Controller (GC): Woodward.
3. Metering Equipment: Shark 250.

C. Acceptable manufacturers of all components not otherwise indicated shall be ABB, Allen-Bradley, Eaton, General Electric, IDEC, or Square D.

2.3 SWITCHGEAR ENCLOSURE

A. Where new panel faces are required for installation of new face mounted equipment, the panels shall be minimum 14 gauge steel, painted as indicated below.

B. Where back or side pans are required for installation of new equipment and wiring, the panels shall be minimum 16 gauge steel, painted as indicated below.

C. Panel faces and back/side pans shall be coordinated for proper fit and function within the existing switchgear cabinets.

2.4 PAINTING

A. Steel and iron surfaces shall be protected by suitable paint or coatings. 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.

B. The color of the exterior panel finish coats shall be ANSI 61 light gray. The color of the interior back and side pans shall be white.

2.5 CONTROL WIRING

A. All new control wiring for the switchgear 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.

B. Terminate all wiring 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. Provide all terminal blocks and exposed relays located in the controls compartment with a plastic safety cover. Terminal blocks for DC circuits shall be separated from terminal blocks for 120VAC.

C. Wiring shall be installed in a neat and orderly manner in horizontal and vertical wiring troughs or channels with removable covers for easy accessibility. Wire bundles, when required shall not exceed one (1) inch in diameter. Adhesive backed Ty-Rap bases shall not be used to support bundles. All wiring bases shall be securely attached with metal screws.

D. Extra flexible stranding wires shall be used in areas subject to flexing, such as areas where hinged brackets or swing racks/doors are used.

E. Only one wire shall be inserted into a lug. Install lugs with a ratcheting type crimping tool. Tag all wires with wire markers at both ends.

F. Splicing of control, CT, or PT wires is not allowed.

G. All control wiring landing on screw terminals shall have solderless terminals, ABB Sta-Kon or approved equal. Solderless terminals for current transformer leads shall be insulated ring-tongue type, all others shall be insulated fork-tongue type. All lugs and solderless terminals shall be tin-plated copper.

H. Wire current transformer leads to shorting type terminal blocks. Shorting pins shall be provided with storage locations for the shorting pins.

I. Each generator has a terminal strip for interconnection to its switchgear generator section. The switchgear terminal strip shall be arranged and numbered as shown by the terminal strip detail on the original shop drawings. Terminal blocks shall be clearly labeled and shall match the designation shown on the Fabricator's drawings.

J. Both ends of each wire shall be identified per the marking and numbering shown on the wiring drawings with heat shrink or wrap-around adhesive labels.

K. All ground wires shall have green insulation. Note that wires larger than #6 may be marked with green tape.

2.6 BUS BAR (NOT USED THIS SECTION)

2.7 GENERATOR AND DISTRIBUTION CIRCUIT BREAKER

A. All generator, feeder, and station service circuit breakers are existing and shall remain in service.

2.8 SWITCHGEAR DEVICES

Note that some of the devices listed below may not be required for some systems. Check the manufacturer's original switchgear shop drawings for specific requirements. Where required, furnish as specified.

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. Provide nameplates 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 Authority. Nameplates inside the switchgear located on the front doors may be attached using adhesive epoxy.

Relays shall have the nameplates installed separate from the relay such that the relay can be removed without affecting the nameplate. Route all wiring such that it does not inhibit the visibility of the nameplate or interfere with the removal of the relay.

B. Selector Switches. Selector switches shall be heavy-duty metal 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.

1. System Mode Switch. AUTO/MAN ISOCH, Two-position lever operated maintained contact. Electroswitch 24201C or approved equal.

2. Feeder Breaker Control Switch. TRIP/ - /CLOSE Three-position lever operated momentary contact spring return to center, Electroswitch 2438D or approved equal.

C. Generator Lockout Switch (GLS). Key operated maintained contact OFF/RUN switch with normally closed contact. Allen Bradley 800FM-KM21 with metal latch 800F-ALM, Eaton Series 10250T1511-2, or approved equal.

D. Reset and Test Buttons. Push type momentary contact, normally open, 22 mm, non-illuminated, flush mount with heavy duty metal latch. Allen Bradley 800FM-F2, or approved equal. Color as indicated. Provide contact blocks as required.

E. Emergency Stop Button. Red push/pull maintained normally closed late-break contact with protective finger safe guard and yellow emergency-stop ring. Allen Bradley 800TC-FX6D4 operator, with 800T-NX1320 black guard, 800T-X646EM Yellow E-Stop ring and 800TC-XD1 normally open finger safe contact block, or approved equal.

F. Annunciator Lights. LED cluster type panel mount lamps, 24 VDC. IDEC Corp. Series SLC40N, APEX Automation Solutions L7525 series, or approved equal.

G. Enclosure Light. LED illumination kit with motion sensor, 24VDC. Rittal 2500320, STEGO 025411-10, or approved equal.

H. Convenience receptacle. 120 volt duplex receptacle, din rail mount, 15 ampere rating, GFI. Phoenix Contact 5600462, Allen Bradley 1492-REC15G, or approved equal.

I. 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-nickel contacts rated for 10 amperes at 120 volts AC. Relays utilized for PLC input, alarm input or indicating light service shall have contacts rated not less than 3 amperes. Provide all relays and timers with indicating lights. IDEC Corp., Phoenix Contact, or approved equal.

1. 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.

2. Dead bus relay shall be IDEC RR3B-ULC, AC120V, with SR3B-05 base, or approved equal.

3. Time delay relay shall be Crouzet OU1R10MV1, or approved equal

J. Circuit Breakers.

1. Protective devices shall be resettable circuit breakers for all AC and DC circuits in the switchgear. Replaceable fuse type devices are not acceptable.

2. Circuit breakers shall be molded case type of the amperage, voltage, short circuit capacity, and number of poles required for the application or as indicated on the one-line diagram.

3. Manually operated molded case circuit breakers protect the branch power circuits of the variable frequency drives (VFDs). Each breaker is provided with a shunt trip.

4. Manually operated molded case circuit breakers protect the station service transformer and other branch circuits as indicated on the one-line diagram on the project design drawings. The breakers are provided with auxiliary contacts to indicate position and a bell alarm for trip indication.

K. 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. Provide current transformers of the window type with brass stud terminals. Insulation shall be suitable for 600 volt service at 60Hz.

1. Current transformers for relay service - minimum C20 accuracy class with a continuous thermal rating factor of 2.0 @ 30°C.

2. Current transformers for meters shall be metering class with a continuous thermal rating factor of 1.5 @ 30°C. For CT ratios 200:5 and greater, provide 0.3% accuracy or greater with a burden rating of B0.1 for CT ratios less than 200:5, provide 1.2% accuracy or greater with a burden rating of B0.1.

3. Multi-Ratio Current Transformers - Provide ratio as indicated with the accuracy specified at full distributed windings.

4. The CT burden shall be suitable for the devices attached without saturating.

5. All CT's shall be provided with shorting type terminal blocks complete with shorting pins.

L. Potential Transformers. Provide minimum 150VA instrument rated potential transformers, quantity and ratio as indicated on the project design drawings. Hammond, Flex-Core, or approved equal. Provide primary and secondary protection using circuit breakers.

M. Control Power Transformers. Provide control power transformers for circuit breaker trip mechanism charging. Minimum 500VA or size required for circuit breakers provided, quantity and ratio as indicated on the project design drawings. Provide primary and secondary protection using circuit breakers. Provide with finger safe terminal covers. Hammond or approved equal.

N. Ambient Air Temperature Sensors. Provide moderate temperature range, 3-wire, platinum RTD, 100 ohms +/- 0.15%, @ 0°C tolerance. For indoor use provide Prosense RTD1-R01-01 with plastic vented housing, or approved equal. For outdoor use, provide Prosense RTD1-C06-01, NEMA 4X, or approved equal.

2.9 GENSET CONTROLLER

A. Genset Controller (GC). Door mounted style with display face, Woodward easYgen Model 3200XT-P1, Part Number 8440-2082, no substitutes.

B. Easygen IKD-1 digital I/O expansion module, 8 inputs, 8 outputs. DIN rail mounting, 24V DC. Woodward 8440-2028.

C. Signal Converter. Multi-input, 4-20mA / 0-10VDC Output. Provide for isolation protection of Easygen analog inputs. Omega DR-I3P, Prosense SCU-1600 or approved equal. Provide minimum one (1) Signal Converter Programming/Display Module SCU-PDM1 with SCU-1600.

D. Additional items, components, or wiring that may be required for a complete and operational system as specified herein.

2.□0 PROGRAMMABLE LOGIC CONTROLLER

A. Programmable Logic Controller. Allen-Bradley, CompactLogix 1769, no substitutes. Provide the following:

1. 24VDC power supply. Allen-Bradley 1769-PB4.

2. CPU (2 Mb Memory, Ethernet). Allen-Bradley 1769-L33ER.

3. Device Net Scanner. Allen-Bradley 1769-SDN.
4. ModBus TCP/IP Communications Module. Pro-Soft MVI69E-MBTCP.
5. Right End Cap/Terminator. 1769-ECR.
6. Compact Blocks, 24VDC, as required which may include the following:
   a. LDX I/O input base module 16 point, universal. Allen-Bradley 1790D-T16BVO.
   b. LDX I/O input expansion module 16 point, universal. Allen-Bradley 1790-T16BVOX.
   c. LDX I/O output base module 16 point, sourcing. Allen-Bradley 1790D-T0B16.
   d. LDX I/O output expansion module 16 point, sourcing. Allen-Bradley 1790-T0B16X.
   e. LDX I/O input/output base module 8 point in, 8 point out sourcing. Allen-Bradley 1790D-T8BV8B.
   f. LDX I/O input/output expansion module 8 point in, 8 point out sourcing. Allen-Bradley 1790-T8BV8BX.
   g. LDX I/O analog input module, 4 channel, 4-20 mA DC. Allen-Bradley 1790D-TN4C0.
   h. LDX I/O analog output module, 2 channel. Allen-Bradley 1790D-TNOC2.
   i. LDX I/O RTD input module, 4 channel. Allen-Bradley 1790D-T4R0
7. Provide additional items as may be indicated on the project design drawings or required for the proper and complete operation of the system as specified.

B. Provide cables, connectors, and interface devices as required for a complete and operational system.

2. OPERATOR INTERFACE UNIT

A. Operator Interface Unit (OIU). A human machine interface (HMI) referred to herein as OIU shall be installed on the front of the switchgear master section door. The OIU shall be an integrated touch screen display computer with solid state drives, Cincoze CV-115C / P1101, or approved equal. The OIU shall meet the following minimum requirements:

1. 15” display with minimum of 1024 x 768 pixel resolution.
2. LCD Color: 16.2M, Pixel Pitch (mm): 0.297 (H) x 0.297 (V).
3. Projected Capacitive Touch.
4. Intel Quad Core Processor, minimum 2.0 GHz. 4 GB SO-DIMM DDR3L 1333 MHz memory, 64 GB SSD Drive.

5. 3 USB 2.0 Ports, 1 USB 3.0 port, 10/100M Ethernet Port, serial port.
6. 24VDC power supply.
7. Windows 10 or 11 Professional or Windows 10 IoT Enterprise, 64 bit.
8. Passive cooling without fan.

2.□2 FEEDER PROTECTION RELAY

A. On systems with existing feeder protection relays they shall remain in service. Submit proposed settings for review as part of the submittal.

2.□3 METERING EQUIPMENT

A. Bus Meter. Class 10 current inputs, 2 MB Memory, 120VAC input, 18-60VDC power supply. Provide with Ethernet communications port, panel mount remote display module, cable, and optional 4-20mA I/O card. SHARK 250-60-10-V2-D-INP100S-20mAOS, no substitutes.

B. Station Service Meter. The station service meter shall be identical to the bus meter except without the optional 4-20mA I/O card. SHARK 250-60-10-V2-D-INP100S-X, no substitutes.

C. Feeder Meter(s). On systems with separate feeder meter(s) as indicated on the Project Design Drawings, the feeder meters shall be identical to the station service meter. SHARK 250-60-10-V2-D-INP100S-X, no substitutes.

D. Provide all cables, connectors, and other devices including CT shorting terminal blocks as required for a complete and operational metering system.

2.□4 DATA STORAGE SERVER

A. An industrial fanless mini PC shall be installed in the switchgear master section. The mini PC shall be as follows:

1. Processor: Intel Core i7
2. Ram: 16 GB, SO-DIMM DDR4 3200MHz (non-ECC)
3. Hard drive: minimum 1 TB M.2 NVMe SSD
4. Auto Power On
5. Dust Filter for Small Form Factor
6. Windows 10 IoT Enterprise, 64 bit
7. DIN Rail Mounting Kit or Mounting as required
8. 60W 12VDC Power Supply
9. OnLogic ML100G-53, or approved equal.

B. Furnish and install all cables and interface devices required for a complete and operational system plus any additional devices that may be required to be fully functional and meet the requirements of these specifications.

2.05 LOCAL AND REMOTE ACCESS

A. Provide the switchgear with an Ethernet connection for access to the switchgear LAN via high speed internet. See Summary of Work, Section 01 11 13, for internet service requirements.

B. Industrial Ethernet Switch. 16 port, Unmanaged, 10/100/1000 MBPS, 24VDC Ethernet switch, Phoenix Contact FL SWITCH 1116N, 1085219 or approved equal. All equipment shall be connected to provide seamless communication between the PLC, LAN devices and the Ethernet connection to the Internet. Provide multiple switches for systems requiring more than 16 ports.

C. The data storage server shall store historical and real time data from the PLC, Bus and Station Service Meters, Radiator and Charge Air Cooler VFD's, Genset Controllers, Feeder Protection Relay(s), and other LAN-connected devices, and shall provide the primary means for remote access via LogMeIn for data retrieval, remote monitoring, and device programming access.

D. All devices on the switchgear LAN shall be remotely accessible via the internet for system monitoring, data acquisition, and troubleshooting. Remote access shall allow a technician in another location to modify and/or view all operational screens and all logic in the PLC, as well as the GCs, FPR, VFDs, Data Storage Server, metering equipment and LAN Router.

E. Provide communications connections as required for the proper operation and control of the systems.

2.06 CONTROL POWER

A. Control power for the switchgear shall be 24VDC, except where specifically indicated otherwise. All meters and other components requiring auxiliary power to operate shall operate from the 24VDC control power source, unless otherwise specified. All control circuits shall be 24VDC.

B. Provide a complete 24VDC power supply with redundant secondary backup. Include all items described below plus all other components required for a complete system. The primary source shall be a 120VAC to 24VDC power supply using 120VAC station service power. The secondary source shall be from a 24VDC-24VDC battery buffer module using power either from 24VDC engine batteries, or from 12VDC-24VDC converters powered from 12VDC engine batteries, as indicated below. The 24VDC control power system shall include the following major equipment:

1. Primary Power Supply. 100-240VAC primary input, minimum 20 amp, 24VDC output at 45°C. PULS CP20.241-S1, Phoenix Contact 2904602, or approved equal. Install in the master section. Set output to 26 VDC to ensure it operates as the primary source when AC power is available.

2. Battery Buffer Module. 22-29VDC input, minimum 15 amp, 24VDC output. The module shall include capacitors to buffer power during engine crank cycles with a minimum capacity of 15A for 9 seconds. Siemens 6EP1933-2EC51, or approved equal. Install module in the master section.

Set dipswitch 3 to ON (22.5VDC cut-in) and dipswitch 12 to ON (Operating State).

3. Power Bridge Rectifier. 35A minimum. Powersem PSB-35/08 or approved equal.

4. 12VDC-24VDC Converter. 12VDC input, minimum 4 amp, 24VDC output at 45°C. PULS CD5.243, or approved equal. Install minimum 2 converters connected in parallel in each 12V generator section.

C. The DC power from the engine batteries shall enter in the respective generator section. A 20A circuit breaker shall be installed on the battery power supply.

D. The 24VDC outputs from each generator section shall be connected to the 24VDC input on the battery buffer module in the master section through power bridge rectifiers, quantity as required for the number of inputs.

E. The 24VDC outputs from the Primary Power Supply, the Battery Buffer Module, and the engine batteries shall be connected together in the master section through power bridge rectifiers. The power sources shall be coordinated to automatically switch from the 120VAC source to the 24VDC source upon loss of AC power and automatically switch back when the AC power is restored. The system shall provide continuous power without interruption prioritized as follows:

1. Primary Power Supply (120V AC Source - Primary).

2. Battery Buffer Module (24V DC Source - Secondary).

3. Engine Batteries (in the event of a fault of the Battery Buffer Module).

F. The 24VDC power supply to each switchgear section (master, generator, and feeder/VFD) shall be isolated through a 15A circuit breaker in each respective section.

G. Each major device or meter shall be individually protected by circuit breakers. Clearly mark each circuit breaker for the intended service.

H. 120VAC Circuit Breaker Charging - Power for the distribution feeder circuit breaker spring charging motor(s) is from a control power transformer connected to the main bus. Power for the generator circuit breaker spring charging motors is from a control power transformer connected on the generator side of the circuit breaker.

I. 120VAC Control and Utility Power – Provide 2 sets of terminals for connection of incoming 120VAC power, 20A, single phase. One shall be for utility power and one for control power as indicated. The 120VAC system shall include:

1. Utility Power – One circuit shall provide power for ventilation fans and convenience receptacle.

2. Control Power - One circuit shall provide power to the UPS and to the 120VAC to 24VDC Primary Power Supply. No other devices shall be connected to this circuit. Provide a 15A circuit breaker to serve the UPS and a 10A circuit breaker to serve the Primary Power Supply.

3. UPS – Rack-mount UPS shall be complete with a sealed leak-proof maintenance free lead acid battery. It shall be 120V, 60Hz, 15A input and 120V, 60Hz, 1500VA output. Tripp-Lite SMART1500LCD, APC SMT 1500C or approved equal.

4. The UPS shall be installed in the master section and shall be connected to provide 120VAC power to the data storage server and internet router (provided by others).

2.07 VARIABLE FREQUENCY DRIVES

A. Existing variable frequency drives and associated components shall remain in service.

2.08 ENGINE/GENERATOR SECTION ASSEMBLY

A. Provide the following components for each generator section as required to allow automatic or manual operation and control of each generator.

1. Genset Controller (GC). The GC shall communicate with the PLC via Devicenet I/O Blocks through the DeviceNet scanner. The top of the GC screen shall not exceed 60” above the bottom of the switchgear.

a. Signal Converter. Provide a signal converter on Analog Inputs 1 thru 3, to provide isolation and protection

b. EasYgen IKD-1 digital I/O expansion module. Provide as needed to meet the functional requirements of the system.

2. Generator Lockout Switch. Provide a key operated OFF/RUN switch mounted in each generator control section door. All switches for the entire project shall utilize a common key. Provide two keys for each generator section.

3. Provide Terminal Blocks, Relays, Timers, Bases, as needed.

4. Provide a new LED panel illumination kit complete with door switch.

5. Provide a new 24VDC 15A circuit breaker for control power.

B. Connect to existing Generator Lockout Switch or provide new as required.

C. Connect to existing potential transformers.

D. Connect to existing current transformers and/or provide new as indicated on project design drawings. Install shorting pins in shorting terminal blocks prior to disconnecting CTs.

E. Connect to existing control power transformer for spring charging motor on systems with electrically operated breaker.

F. Connect to existing generator contactor/breaker status annunciation lamps, or provide new as required.

G. Connect to existing alarm annunciation lamps mounted near top of each switchgear cabinet. See existing switchgear drawings for function.

H. For generators with mechanical governors and Caterpillar engines using PL100E or CAT Datalink Gateways, provide the following controls and sensors to interface with the GC:

1. Configurable Input/Output Module. Converts analog and digital I/O's to J1939. 8-24VDC input, CAN J1939 port, 4 digital inputs, 2 digital outputs, Type K and J thermocouple input, 2 analog inputs (battery voltage and configurable 0-5VDC or 4-20mA), and Magnetic Pick-up input for speed sensing. Murphy, XM500 P/N: 78700420 or approved equal.
2. Oil Pressure Sending Unit. 1/8" NPT connection, 0-100 psi, 2-wire ungrounded. Murphy ES2P-100 P/N: 05701858 or approved equal. Connect to XM500 Pin1-Grey.
3. Temperature Sending Unit. 1/2" NPT connection, 2-wire ungrounded. Murphy ES2T-250-1/2 P/N: 10702013 or approved equal. Connect to XM500 Pin4-Grey. Include optional terminal boot.
4. Engine Speed Control. Reuse existing engine mag pickup and speed control governor. Connect mag pickup to XM500 and to GC mag pickup input. Connect existing governor speed bias to GC Analog Output 1, and configure GC output as required for existing governor speed bias.

2.□9 MASTER SECTION ASSEMBLY

A. Provide the following components in the master section:

1. PLC.
2. OIU.
3. Bus Meter.
4. Station Service Meter.
5. Feeder Meters on systems with separate feeder meters, quantity as required.
6. Data Storage Server.
7. Control Power Supply, 120VAC / 24VDC.
8. Battery Buffer Module.
9. Uninterruptable Power System (UPS)
10. Dead bus relay.
11. Industrial Ethernet Switch, minimum quantity two
12. Provide a single LAMP TEST push button that tests all master section and engine generator section annunciation LEDs simultaneously. Note that this includes all master and generator section lamps but does not include VFD lamps.
13. Terminal Blocks, Relays, Timers, Bases, as required.

14. Enclosure LED illumination kit, complete with motion sensor.
15. Convenience receptacle, 120 volt duplex GFI receptacle, din rail mount, 15 ampere rating.
16. Provide a new 15-amp circuit breaker for the switchgear AC power to the fans and receptacle. Power supply shall be from the station service power.
17. Provide a new 24VDC 15A circuit breaker for control power, as needed. Spare Input: Provide a minimum of 2 spare PLC discreet input pairs wired to terminal blocks.
18. Spare Output: Provide a minimum of 2 spare two-pole relays wired to terminal blocks and controlled by PLC.

B. Connect to existing Generator Lockout Switch or provide new as required.

C. Connect to existing System Mode Switch or provide new as required.

D. Connect to existing Emergency Stop Switch or provide new as required.

E. Connect to existing alarm annunciation lamps mounted near top of each switchgear cabinet. See existing switchgear drawings for function.

F. Provide two ambient air temperature sensors, one for outside air temperature and one for inside air temperature. Final field installation shall be outside the switchgear.

2.20 DISTRIBUTION FEEDER/VFD SECTION ASSEMBLY

A. Each distribution feeder has either an electrically operated contactor or electrically operated circuit breaker to perform the normal online/offline functions. A distribution feeder with an electrically operated contactor also has a molded case circuit breaker for equipment and conductor protection. Note some feeders are equipped with a feeder protection relay (FPR).

B. Where equipped, the existing FPR will remain in service and control the protective trip function for the distribution feeder breaker.

C. Connect to existing circuit breaker shunt trip and alarm indication as required.

D. Connect to existing potential transformers.

E. Connect to existing current transformers and/or provide new as indicated on project design drawings. Install shorting pins in shorting terminal blocks prior to disconnecting CTs.

F. On systems with electrically operated breaker, connect to existing control power transformer for spring charging motor.

G. Where switchgear is equipped with VFD controls, the following applies:

1. Each VFD is equipped with a manually operated molded case circuit breaker with auxiliary contacts and shunt trip. Auxiliary contacts are provided to indicate breaker position. Wire the closed position contact to the PLC to provide alarm indication any time the breaker is not closed

(either tripped or manually opened). Verify the shunt trip is wired to the overload.

2. Each VFD is equipped with a three-position selector switch to select between VFD /OFF/BYPASS operating modes. A minimum of 2 each auxiliary contacts are provided. The PLC shall provide indication of the selector switch position: VFD Mode, VFD Running, Bypass Mode, as well as VFD Fault and VFD Breaker Open.

3. Terminal blocks are provided in the VFD section for field connection of all external control and power wiring for all VFD's. Use shielded wiring or separate routing for conductors on the load side of all VFDs.

4. Provide power for radiator control and temperature sensors from the 24VDC switchgear control power.

5. Provide ambient air temperature sensor permanently installed within the VFD section. For systems with more than one VFD section, provided one sensor in each section.

PART 3 - PROGRAMMING, TESTING AND PACKAGING

3.□ SYSTEM PROGRAMMING AND SOFTWARE INSTALLATION

A. The Fabricator shall furnish and install the following software on the Data Storage Server. All licenses shall be in the name of the Alaska Energy Authority

1. AB Studio 5000 Mini Edition EN License (PLC programming software).
2. Woodward Toolkit Easygen (GC configuration software).
3. Square D (SOMOVE). (or software for VFD provided).
4. SHARK metering software (latest version).
5. LogMeIn (AEA will provide installation credentials)
6. Any other devices installed in the switchgear that have custom software.

B. The Fabricator shall provide all PLC and GC programming as required to meet the requirements and intent of this specification.

C. The Fabricator shall prepare a complete tag list of all input/output devices including, but not limited to, the PLC, GC, and all monitored and controlled devices. The Tag List shall be in the form of a spreadsheet. If additional I/O or tags are requested by the Authority the Fabricator shall provide that information. The tag list shall be used in the development of the SCADA system. A copy of the final tag list shall be included in the O&M Manual.

D. The Fabricator shall install the SCADA software as specified in 26 23 05.

E. The Authority will provide a list of I.P. Addresses and Subnet Masks for the Fabricator to assign to all devices on the LAN.

F. The Authority will provide a list of usernames and passwords for the Fabricator to install on the system.

G. The Authority will provide a list of I.P. Addresses and Subnet Masks for the Fabricator to assign to all devices on the LAN.

H. Upon completion of testing, archive at a minimum the following files on the server:

1. The original licensed copy of each software package.
2. The End User License Agreement (EULA).
3. Final setup files for the CG (Woodward wset), FPR (Schweitzer AcSELerator QuickSet), VFD, and Meters.
4. Final PLC programming.
5. Final Tag list.

I. Provide an identical copy of all archived files on a USB thumb drive and submit with the record drawings and other close out materials.

3.2 INSPECTION AND WITNESS TESTING

A. The Authority shall have the right to inspect, at the shop, all equipment covered by these specifications any time during manufacture and assembly and to be present during any equipment tests.

3.3 SHOP TESTING

A. Prior to shipping, the Fabricator shall install software, program equipment and devices, and bench test the control systems to the maximum extent practical. Test procedures shall conform to ASME, IEEE, 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. The Fabricator shall calibrate and set all protective devices.

D. Tests that are provided by the manufacturer of the equipment need not be duplicated. Provide documentation that the manufacturer's test was performed and passed.

3.4 FIELD TESTING

A. Upon completion of field installation the Contractor shall fully test the switchgear. See Section 01 11 13 - Summary of Work for additional testing requirements.

B. Prior to field testing the SCADA system shall be fully functional as specified in Section 26 23 05. The switchgear control system shall be fully tested using the SCADA system as specified herein. The OIU shall be fully functional and the switchgear shall be fully tested using the OIU. All alarm and control functions specified shall be available and indicated on the OIU.

C. Test procedures shall conform to ASME, IEEE, and ANSI standards, and NEMA standard practices section on testing, as appropriate and applicable. The

Contractor 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.

D. Field Testing and Commissioning shall coincide with Substantial Completion. Provide written notice to the Authority in accordance with 01 77 00 Contract Closeout. The Authority reserves the right to witness all tests.

E. Prior to performing tests verify that all field assembly is complete and all interconnecting wiring has been connected, secured and torqued to manufacturer's specifications.

F. Perform adequate tests prior to Substantial Completion to verify that the switchgear is fully functioning. At a minimum, provide the following operational tests:

1. Verify that the system performs the sequence of operations as specified under Part 4.
2. Verify all engine and generator monitoring and control functions for each GC.
3. Verify all engine and generator protection functions for each GC.
4. Verify all feeder protection functions for the FPR.
5. Verify that the PLC starts and stops each generator based on the control requirements specified under Part 4.
6. Verify that each VFD operates properly.
7. Verify that each annunciation point operates correctly. For external alarms, simulate the alarm.
8. Verify that all screens on the SCADA display correct data. Use an external computer to verify remote access for SCADA.
9. Verify that all trending functions are operational and are being archived on the data storage server.
10. Disconnect 120-volt AC control power in the master section to verify that the system continues to operate without interruption from the 24VDC source and that the server continues to operate from the UPS.

G. Repeat tests during Substantial Completion as required by the Authority to adequately demonstrate satisfactory operation of all functions.

3.5 PACKAGING

A. All 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.

B. Exterior of crating shall be clearly marked with the community name and the contents identification (e.g. “Community” Gen #2).

C. Two copies of the packing slip identifying the quantity of pallets, the crates/boxes on each pallet, and the listing of component packages within each box/crate shall be provided to the Owner.

PART 4 - MONITORING, CONTROL, AND SEQUENCE OF OPERATION

4.□ ENGINE MONITORING

A. The GC shall monitor temperatures, alarms and status of the following engine devices:

1. Electronically Governed Engine. Monitor engine speed, jacket water temperature, lubricating oil pressure, and fuel flow rate from the engine ECU via J1939.

2. Mechanically Governed Engine. Monitor engine speed, jacket water temperature, and lubricating oil pressure from the specified Configurable Input/Output Module via J1939.

3. Engine Runtime. Log and maintain engine runtime. Time shall be expressed in hours. Note that when the engine ECU is off, the SCADA shall continue to display the Engine Hours at the time the engine stopped.

4. Hours until Engine Service. Using the engine runtime from the GC, the PLC will log and maintain hours until engine service required. Time shall be expressed in hours.

5. Generator Lockout Switch. Connect key switch to GC Discrete Input 5.

6. Oil Level Switch. Monitor status of engine-mounted oil level switch through GC Discrete Input 3 and 4. A normally open switch closes when the oil level drops below or rises above a pre-determined level.

7. Exhaust Gas Temperature. Monitor exhaust temperature through GC Analog Input 1 via a 4-20mA signal converter. The exhaust gas temperature sensor is a 2-wire 100 ohm RTD or Type K thermocouple.

8. Air Filter Vacuum. Monitor air filter vacuum through a normally open switch which will close indicating air filter restriction.

9. Intake Air Temperature. For engines with a charge air cooler, monitor intake air temperature through GC Analog Input 3 via a new 4-20mA signal converter. The existing intake air temperature transmitter is 4-20 mA, 20°F to 240°F range. Power supply for the signal converter shall be provided from the GC power supply. Signal shall be series looped through the GC and the engine charge air cooler VFD.

4.2 AMBIENT AIR TEMPERATURE MONITORING

A. The PLC shall monitor through the DeviceNet RTD input module the following air temperatures.

1. Outside air temperature.
2. Inside air temperature.
3. VFD section temperature(s).

4.3 FUEL AND OIL SYSTEM MONITORING

A. The PLC shall monitor and provide the following:

1. Plant Total Fuel Consumption and Last Day Tank Fill Cycle Quantity. The PLC shall calculate the total plant fuel consumption and the last day tank fill cycle quantity from the day tank supply meter. Monitor daytank meter pulser through existing DeviceNet I/O block. The existing day tank meter pulser provides one pulse per each gallon of fuel.
2. Plant Fuel Efficiency. The PLC shall calculate the overall plant fuel efficiency (kWh/gallon). At the end of each day tank fill cycle, divide the total kWh generated since the end of the last fill cycle (from bus power meter) by the gallons of fuel pumped into the day tank during the latest fill cycle.
3. Low Fuel Level Alarm. A normally closed contact on the existing day tank control panel will open when the fuel level in the day tank drops below a preset level.
4. Generator Fuel Consumption. For electronically governed engines, the PLC shall read the instantaneous fuel flow rate (gallons per hour) and the total fuel consumption (gallons) from the engine ECU via J1939.
5. Monitor status of the day tank. *Note that some existing systems may have limited or no inputs for the day tank.* Complete monitoring will include the following:
   a. Day Tank Control Power.
   b. Day Tank Pump Run (P-DF1).
   c. Day Tank Low Level Alarm.
   d. Day Tank Overfill Alarm.
   e. Day Tank Pump Time Out Alarm (P-DF1).
   f. Remote Actuator Valve Open.
6. Monitor status of the used oil blender. *Note that some existing systems do not have an oil blender or do not have monitoring inputs.* Complete blender monitoring will include the following: including:
   a. Blender Control Power.
   b. Blender Pump Run (P-DF2).
   c. Blender Pump Run (P-UO2).
   d. Blender Hopper Low Oil Level.
   e. Blender Filter #1 Plugged.

f. Blender Filter #2 Plugged.

7. Monitor the fluid level and temperature in the day tank, and where applicable, in the intermediate fuel tank. *Note that some existing systems do not have tank level and temperature monitoring.*

8. Plant Total Used Oil Blending System Consumption, Last Oil Blend Cycle Quantity and Overall Blended Oil Percentage. The PLC shall calculate the total used-oil use, the last blend cycle gallons, and the overall percentage of blended oil in the fuel supply. The data for these calculations comes from the day tank meter pulser (at one pulse per each gallon of fuel) and the tank level monitoring system. *Note that some existing systems do not have used oil blending and monitoring.*

4.4 COOLING SYSTEM MONITORING

A. The PLC shall monitor through the DeviceNet input module the following:

1. Low Coolant Alarm. Monitor low coolant level switch status. An existing normally closed switch in the coolant piping will open when the coolant drops below a preset level.

2. Engine Coolant Return Temperature. Monitor engine coolant return temperature via an existing 4-20 mA, 20°F to 240°F range temperature transmitter. Power supply for the transmitter shall be provided from the switchgear 24VDC power supply.

4.5 HEAT RECOVERY SYSTEM MONITORING

A. The PLC shall monitor heat recovery data through the DeviceNet analog input module. *Note that some existing systems do not have heat recovery systems or monitoring.* Complete monitoring will include the following:

1. Heat Recovery Supply Temperature. Monitor heat recovery supply temperature via an existing 4-20 mA, 20°F to 240°F range temperature transmitter. Power supply for the transmitter shall be provided from the switchgear 24VDC power supply.

2. Heat Recovery Return Temperature. Monitor heat recovery return temperature via an existing 4-20 mA, 20°F to 240°F range temperature transmitter. Power supply for the transmitter shall be provided from the switchgear 24VDC power supply.

3. Heat Recovery Pressure. Monitor heat recovery fluid pressure via an existing 4-20 mA, 0 to 60 PSIG range pressure transmitter. Power supply for the transmitter shall be provided from the switchgear 24VDC power supply.

4. Heat Recovery Flow Rate. Monitor heat recovery fluid flow rate via an existing 4-20 mA, 0 to 100 GPM range flow meter. Power supply shall be provided from the switchgear 24VDC power supply.

4.6 OIU DISPLAY

The OIU shall provide the operator local access to the demand control system setup parameters and shall display all screens required for system monitoring. The OIU shall communicate with the data storage server via the LAN for SCADA information. The OIU programming and development of all display screens shall be provided by the Fabricator, see SCADA specification 26 23 05. The Fabricator shall program the following functions and display the following data. All multiplication factors or other proportional scaling of the raw data shall be provided by the Fabricator so the data provided will not need to be modified.

A. Demand Control – Generator kW rating (overload level), raise level set point, raise level time duration, lower level set point, lower level time duration.

B. Generator Control – Amount of time each generator will run off-line before it is shut down (cooldown duration). Enable/disable droop unloading and the kW load or amount of time before going offline. Provide Lead/lag selection where two generators are the same capacity.

C. Engine/Generator Data.

1. Alarms – All engine/generator alarm conditions.
2. Status of the engine (Off, Auto, Manual)
3. Status of the breaker (open or closed).
4. Phases A, B, and C voltage, current, and power factor.
5. Generator Frequency (Hz).
6. Engine Speed (RPM).
7. Engine Run Time (hours).
8. Hours until Engine Service (hours).
9. Engine Water Jacket Temperature (°F).
10. Engine Exhaust Temperature (°F).
11. Engine Oil Pressure (PSI).
12. Engine Air Cleaner Vacuum (in-H2O).
13. Engine Fuel Flow Rate (GPH) – engines with an ECU.
14. Engine Total Fuel Use (Gal).
15. Total kWh Generated.
16. Fuel Efficiency (kWh/Gal).
17. Engine Oil Level Switch
18. Engine ECU – All available data from Engine Control Unit (ECU)
19. Lead Engine - where engines are the same capacity.
20. Intake Air Temperature - for engines with a charge air cooler.

D. Bus/Station Service Power Data.

1. Bus Phases A, B, and C voltage and current.
2. Bus frequency, kVAR, kW and power factor, total kWh and peak demand.
3. Station service Phases A, B, and C current.
4. Station service kW and total kWh.
5. Trip indication for station service breaker.

E. Feeder Data.

1. Position indication for each feeder contactor/breaker
2. Trip indication for each feeder breaker.
3. Feeder Monitoring kW and total kWh. Where systems without a feeder power meter, calculate the feeder kW and kWh by subtracting the station service readings from the bus meter readings.
4. Feeder Metering. For systems with feeder power meters provide equivalent data to the station service metering.

F. DeviceNet Status.

G. Fuel/Oil System Data. *As previously noted, some existing systems may have limited or no inputs for the fuel and oil systems.*

1. Fuel level and temperature in day tank, used oil hopper, and intermediate tank (where applicable).
2. Plant total fuel use (Gal).
3. Plant total fuel efficiency (kWh/Gal).
4. Plant previous 30 minute fuel efficiency.
5. Day tank last fill quantity.
6. Day tank pump run (P-DF1).
7. Day tank control power.
8. Day tank low level alarm.
9. Day tank overfill alarm.
10. Day tank pump time out alarm (P-DF1).
11. Remote actuator valve open.
12. Last oil blend quantity.
13. Overall oil blend percentage.
14. Plant total used oil blended.
15. Blender pump run (P-DF2).
16. Blender pump run (P-UO2).
17. Blender Control Power.

18. Blender filter #1 plugged.
19. Blender filter #2 plugged.
20. Blender filter #3 plugged.
21. Blender used oil hopper low alarm.

H. Ambient Temperature Data.
1. Outside Air Temperature.
2. Inside Air Temperature.
3. VFD Section Temperature(s).

I. Engine Coolant Data:
1. Low engine coolant level alarm.
2. Engine coolant return temperature.

J. VFD Data – All data available from each variable frequency drive, quantity as indicated on the communication diagram of the attached drawings.
1. Radiator coolant temperature.
2. Intake air temperature - for engines with a charge air cooler.
3. VFD breaker open.
4. VFD frequency.
5. VFD status (VFD, Off, Bypass, Running, Fault).

K. Heat Recovery System Data. *As previously noted, some existing systems may not have heat recovery systems or monitoring.*
1. Supply Temperature.
2. Supply Temperature Signal Lost.
3. Return Temperature.
4. Return Temperature Signal Lost.
5. System Pressure.
6. Flow Rate.
7. No Load Warning.
8. Loss of Pressure.
9. Loss of Flow.
10. Recovered Heat Output.
11. Total Recovered Heat Delivered.

L. Special Conditions:
1. On a system with a backup PLC, eliminate backup PLC annunciation lamps and nameplates.

2. On a system with a remotely operated fuel valve, provide Fuel Valve Open and Fuel Valve Closed indication.

3. On a system with a hydroelectric system, provide Hydro Alarm/Comm Fault indication.

4.7 GENERAL CONTROL SPECIFICATIONS

A. The switchgear shall automatically and manually connect and parallel all generators to the switchgear main bus.

B. The PLC shall control the demand control system and overall sequencing, starting, and stopping of the engine generators. The SCADA on the OIU shall provide operator access to the demand control settings and shall display the current demand control settings and status.

C. The GC shall control all functions and features of the generator under both automatic and manual control. The GC shall start, stop, synchronize, and provide load sharing of the generator. All GC's shall communicate via the CAN #1 bus for load sharing. If the communications bus is disabled, each GC shall be fully capable of operating the individual generator in manual mode.

D. The Fabricator shall review all project design drawings and information provided and shall incorporate all required engine and generator safety functions into the GC.

4.8 GENERATION SEQUENCE OF OPERATION.

A. A complete and successfully operating system shall be provided for starting, stopping, and paralleling, both automatically and manually, all engine generators. The following paragraphs describe the basic functional requirements of the system. The Fabricator shall be responsible for the detailed design to provide a safe and satisfactorily functioning system.

B. The PLC shall monitor the system load and status and shall control automatic start and stop of each unit. Time delays shall be incorporated in the PLC that shall be adjustable through the OIU. Use relays in conjunction with PLC logic for automatic start/stop. 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. The GC shall be configured according to the parameters indicated in Attachment A, Genset Controller Settings Table, which is appended at the end of this Section.

D. The GC shall control engine speed, voltage compensation, synchronization, and generator contactor/breaker operation.

1. The GC shall perform all engine and generator safety functions. Provide annunciation through the PLC via DeviceNet blocks.

2. The GC shall perform the cranking and disconnecting of the starter.

3. The GC shall turn on the run signal to the ECU then have a 5 second delay before cranking the starter to ensure fuel is up to pressure. During the delay the GC shall display a banner indicating pre-start mode.

4. The GC shall control the engine speed using 0.5-4.5 VDC signal to the engine ECU, or +/- 3VDC signal for a mechanically governed engine.

5. The GC shall make up to 4 attempts to start an engine with a pre-set cranking time of 10 seconds and a 10 second pause between each attempt. If the engine does not start after the fourth time, the OVERCRANK and ENGINE ALARM lamp will illuminate and a FAIL TO START message will appear on the monitoring screen.

6. The GC shall control the voltage regulator through the voltage regulator auxiliary voltage bias input.

7. Generator Lockout Switch. When in the OFF position the switch shall disable the GC and prevent engine starting.

E. Upon activation of the dead bus relay the feeder contactor/breaker shall open. This function shall be independent of the PLC and shall operate in all modes.

F. Automatic Operating Conditions.

1. With the System Mode Switch in the “AUTO” position and each GC in “AUTO” mode, the following sequences of operation shall be performed:

a. Dead-Bus Startup: All available generators shall start and come up to rated speed. The generators shall be started sequentially in order of generator number with a 15 second delay between each start signal. The first unit to stabilize will close to the dead bus. The remaining units shall auto-synchronize to that unit and close to the bus in sequence. After 15 second delay after the last generator comes on line, the PLC shall close the feeder breaker and energize the feeder. On systems with two feeder breakers the PLC shall close feeder breaker #1 and then after an additional time delay of 15 seconds, the PLC shall close feeder breaker #2. If available, a minimum of two units shall be running and synchronized prior to energizing the feeder. If only one generator is available for operation, the PLC shall use that unit to energize the feeder.

b. With all available units operating and all GC's in “AUTO” mode, the PLC shall monitor the bus load and determine which unit best fits the demand load. The PLC shall signal the GC to unload and shut down any unit not needed to meet the load.

c. When the load exceeds a preset percentage of the prime power rating of a unit, the PLC shall signal the GC to automatically start, synchronize, and connect to the bus another unit. Predetermined demand level set points in the PLC shall determine which unit should be placed online. If that unit is not available, the PLC shall automatically switch to another unit. The PLC shall continue to monitor load and signal the appropriate GC to start, synchronize, unload, and stop as required, to match the appropriate unit to the load.

d. Provide lead/lag control for multiple generators of the same capacity so the operator can manually select one generator to run preferentially. When a second generator is required or the lead generator faults, the PLC shall select the next unit in numerical order (2--3--4--1).

e. When any GC is not in "AUTO" mode, the PLC shall skip that unit and switch to the next available unit. Any time a unit's GC is switched from "STOP" or "MAN" to "AUTO" mode, the PLC shall compare the unit with the operating unit and load to determine which unit is more appropriate for the load. If the new unit is more appropriate, the PLC shall send a command signal to the GC to start, synchronize, and connect the unit to the bus and unload and shut down the other.

f. When one unit is operating and is dropped from the bus, for any reason, the PLC shall signal all GC's to automatically start all remaining available units and perform a dead bus start up sequence as previously specified. After the bus is stabilized, the PLC shall resume normal demand level control operation and signal the GC's to shut down units not required to carry the load.

g. When two units are operating and one of the units is dropped from the bus for any reason, the PLC shall check the raise level and overload level of the unit operating. When the system demand exceeds the raise level of the operating unit, the PLC shall signal the GC to start the next unit and place it in service after the raise level time delay times out. When the system demand exceeds the overload level of the operating unit, the PLC shall immediately signal the GC to start the next unit available under the automatic demand system and place it in service within 10 seconds.

h. The GC shall provide a programmable cool down period for each unit prior to engine shut down. Each unit shall operate at rated speed for 3 minutes, and then automatically stop the engine.

i. When the GC of an operating unit is switched to "MAN" mode, the PLC shall signal the GC to start another unit, as specified above. The unit placed in "MAN" mode will continue to run until the GC is switched to "STOP" or placed in "AUTO".

j. When the GC of an operating unit is switched to "STOP" mode, the GC will check to see if any other generators are online. If there is another unit on-line, the GC will shed the load to the other unit, open the generator contactor/breaker, and shut off the engine after a cool-down period. If there is no other unit on-line, the generator contactor/breaker will open and the engine will shut off after a cool-down period.

k. Upon normal shut down of a unit, all parameters shall be automatically reset to allow the unit to be operated again, either manually or automatically, without further reset action.

2. When the System Mode Switch is switched from the "AUTO" position to the "MAN" position while units are operating in automatic mode, the system shall continue to operate in the present state. If the Mode Switch is moved back to the "AUTO" position, the PLC shall revert to operation in the automatic demand mode.

3. Demand Control: The automatic Demand Control System shall provide 2 levels of starting control and 1 level of stopping control.

a. The 2nd level of starting control is considered the "overload" level and it shall be equal to the generator prime power rating. When the load equals or exceeds the "overload" level the system shall immediately go to the next higher demand level.

b. The 1st level of starting control is considered the "raise" level and it shall normally be equal to 90% of the generator prime power rating. When the load equals or exceeds the "raise" level for 20 seconds, adjustable, the system shall go to the next higher demand level.

c. The stopping control is considered the "lower" level and it shall normally be equal to 80% of the generator prime power rating. When the load is less than the "lower" level for 120 seconds, adjustable, the system shall go to the next lower demand level.

See Attachment B for preliminary Demand Control settings. *Note that the preliminary settings are based on generation capacity data that has not been field verified. The settings may need to be revised upon confirmation of actual generation capacity.*

G. Manual Operating Condition. When the System Mode Switch is in the "MAN" position each generator GC shall control the respective generator in isochronous mode. The GC must be placed in MAN mode to start, stop, and control the generator. All functions shall be manually executed through the GC. If multiple generators are placed online the GC's shall proportionally share load.

H. 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 1 (Engine Alarm Soft Shutdown):

Upon alarm condition bring another generator on line, unload the first generator, open the generator contactor/breaker, run engine through a cool down cycle, shut down engine, and illuminate "Alarm/Lockout" light and associated alarm annunciation light. Alarm light shall remain illuminated until the problem is corrected

and the GC is manually reset. Note that this a Class B Easygen alarm with PLC assist to first start another generator and then take the first generator offline.

b. Type 2 (Engine Alarm Hard Shutdown):

Upon alarm, immediately open the generator contactor/breaker and shut down without going through a cool down cycle. Illuminate "Alarm/Lockout" light and associated alarm annunciation light. Unit shall be locked out and alarm light shall remain illuminated until the problem is corrected and the GC is manually reset. Note that this a Class F Easygen alarm.

c. Type 3 (Generation Alarm):

Upon alarm, immediately open the generator contactor/breaker, run engine through a cool down cycle, shut down engine, and illuminate "Alarm/Lockout" light and associated alarm annunciation light. Unit shall be locked out and alarm light shall remain illuminated until the problem is corrected and the GC is manually reset. Note that this a Class D Easygen alarm.

2. For the following engine/generator alarm conditions perform the sequence indicated and illuminate the associated alarm light. See Attachment A, Genset Controller Settings Table, and Attachment B, Community Demand Control and Alarm Settings Table, for preliminary alarm and shut down setpoints and time delays. *Note that the preliminary settings are based on engine, breaker, and conductor data that has not been field verified. The settings may need to be revised upon confirmation of actual installed equipment.*

a. Low Oil Pressure - Provide a Type 1 soft shutdown when the oil pressure drops to the Alarm level and stays below that level for 5 seconds, or if the pressure transducer signal is lost. Provide a Type 2 hard shutdown when the oil pressure drops to the Shut Down level and stays below that level for 5 seconds.

b. Oil Level - Provide a Type 1 soft shutdown when the oil level switch closes.

c. High Coolant Temperature - Provide a Type 1 soft shutdown when the jacket water temperature reaches the Alarm level and stays above that level for 30 seconds or if the temperature transducer signal is lost. Provide a Type 2 hard shutdown when the jacket water temperature reaches the Shut Down level and stays above that level for 30 seconds.

d. Over Speed - Provide a Type 2 hard shutdown when the engine speed reaches the Shut Down level.

e. Over Crank – Lock out engine if a unit fails to start when the over crank time delay has expired.

f. Running Timeout - Shut down the engine and lock it out if the engine runs without being placed online for 5 minutes, adjustable.

g. Battery Charger Failure – Illuminate the appropriate alarm light when an alarm is received from the battery charger. Note this alarm is for indication only and not shutdown.

h. Air Filter Plugged - Provide a Type 1 soft shutdown upon receipt of an air filter restriction alarm.

i. High Intake Air Temperature - Provide Type 1 soft shutdown when the intake air temperature reaches the Alarm level and stays above that level for 30 seconds or if the temperature signal is lost. Provide a Type 2 shut down when the intake air temperature reaches Shut Down level and stays above that level for 30 seconds. *Note that this only applies to engines with a charge air cooler.*

j. High Exhaust Temperature – Illuminate the associated alarm light when the exhaust temperature reaches the Alarm level and stays above that level for 30 seconds or if the temperature signal is lost. Note this alarm is for indication only and not shutdown.

k. Fail to Synchronize - Provide a Type 3 shutdown if a unit fails to synchronize after the preset time delay.

l. Over Current - Provide a Type 3 shutdown on operation of an overcurrent element. See the project design drawings for the trip setpoint for each generator.

m. Under Voltage - Provide a Type 3 shutdown when the voltage reaches the Shut Down level and stays below that level for 5 seconds.

n. Over Voltage - Provide a Type 3 shutdown when the voltage reaches the Shut Down level and stays above that level for 5 seconds.

o. Under Frequency - Provide a Type 3 shutdown when the frequency reaches the Shut Down level and stays below that level for 5 seconds.

p. Over Frequency - Provide a Type 3 shutdown when the frequency reaches the Shut Down level and stays above that level for 5 seconds.

q. Reverse Power - Provide a Type 3 shutdown when the reverse power reaches the Shut Down level and stays above that level for 5 seconds.

r. Charge Air VFD Failure - If an alarm is received from the charge air cooler VFD (either VFD fault or circuit breaker open), illuminate the associated alarm light. Do not shut down or lock out the unit. *Note that this only applies to engines with a charge air cooler.*

3. For the following system alarm conditions perform the sequence indicated and illuminate the associated alarm light:

   a. Fire Alarm - Upon receipt of a contact closure from the fire suppression system, all engines shall be shut down immediately 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. Emergency Stop - Upon receipt of a contact closure from the Emergency Stop Pushbutton, all engines shall be shut down immediately 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. Low Coolant Level – Opening of the low coolant alarm contact on the system low coolant level switch, all engines shall be shut down immediately 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.

   d. Low Fuel Level - Opening of the low fuel alarm contact on the existing day tank control panel (separate external panel) indicates a low fuel level condition. The low fuel level indication shall start a time delay relay, 2 hours, adjustable, and illuminate the alarm lamp. If the fuel level has not been corrected by the end of the timed interval all engines shall go through a Type 1 soft shutdown and the alarm lamp shall remain illuminated. The manual alarm reset button on the front of the switchgear master section will reset the timer relay for another interval and place the engines back in service if timed out. The reset function shall work any time during or after expiration of the timed interval.

   e. Engine Coolant Return High Temperature Alarm - When the engine coolant return temperature rises above 190°F for a minimum of 2 minutes, the “HIGH COOLANT RETURN TEMPERATURE” lamp shall illuminate. Lamp shall remain on until master reset button is pressed

   f. PLC Failure - Upon failure of the PLC the alarm light shall remain illuminated until the PLC is back in acceptable service.

   g. System Not In Auto – When the System Mode Switch is changed from Auto to Manual the alarm lamp shall illuminate. The alarm lamp shall remain illuminated until the System Mode Switch is switched back to Auto.

   h. Feeder Breaker Trip – Upon over current, the feeder breaker shall immediately trip and the alarm lamp shall illuminate. The generator shall continue to operate at rated speed.

I. Engine Service Alarm Conditions and Sequences. Note that this applies to Auto operation.

1. When an engine exceeds 300 service hours perform the sequence indicated below:

a. The Engine "Alarm/Lockout" annunciator is illuminated.

b. The "Service Engine" annunciator is illuminated

c. Demand control starts the next available engine, syncs it to the bus, closes the breaker, and transfers load.

d. A Type 1 shutdown is performed on the engine with service overdue.

e. Upon completion of the required engine service the operator shall reset the service interval to 300 hours through the Easygen screen menu. The operator shall then press the Alarm Reset pushbutton to clear the engine alarm. Once the service is complete and the alarm is cleared the operator shall put the engine back into Auto mode.

f. Note: If the required engine service is performed manually prior to the Engine Service Alarm condition, the operator shall follow the procedure above without alarm condition in order to reset the service interval to 300 hours and place the engine back in service.

4.9 FEEDER CONTACTOR/BREAKER SEQUENCE OF OPERATION

A. Automatic Operation - When the System Mode Switch is in the "AUTO" position the feeder contactor/breaker shall operate under control of the PLC. The feeder contactor/breaker can be opened at any time by rotating the feeder control knob to the OPEN position. The PLC shall then perform a dead bus start sequence (start all available generators) and re-close the feeder contactor/breaker after the pre-set time delay.

B. Manual Operation - When the System Mode Switch is in the "MAN ISOCH" position and the bus is energized, the feeder contactor/breaker will operate under manual control. The feeder contactor/breaker shall close when the feeder control knob is rotated to the CLOSE position and open when the feeder control knob is rotated to the OPEN position.

C. The Feeder Protection Relay (FPR), where applicable, shall provide protection for the feeder breaker in both Automatic and Manual modes. Attachment B, Community Demand Control and Alarm Settings Table, for preliminary breaker settings. *Note that the preliminary settings are based on breaker and conductor data that has not been field verified. The settings may need to be revised upon confirmation of actual installed equipment.*

4.□0 VFD SEQUENCE OF OPERATION

A. General VFD Sequence of Operation. The variable frequency drives are existing and shall continue to operate in their present mode.

4. HEAT RECOVERY SEQUENCE OF OPERATION

A. The PLC shall perform the following functions. Note that all heat recovery alarms shall be tied to the dead bus signal to prevent alarm indication when the power system is off-line:

1. Heat Recovery No Load Warning. When the heat recovery return temperature is greater than the heat recovery supply temperature for a minimum of 1 hour, the "NO LOAD ON HEAT RECOVERY" lamp shall illuminate. When the heat recovery supply temperature is a minimum of 1°F greater than the heat recovery return temperature the lamp shall turn off.
2. Signal Loss. If either the supply temperature or the return temperature signal is lost, the system shall provide the following message on the OIU "HEAT RECOVERY SUPPLY TEMPERATURE SIGNAL LOST" or "HEAT RECOVERY RETURN TEMPERATURE SIGNAL LOST".
3. Heat Recovery Loss of Pressure Alarm. When the heat recovery system pressure drops below 15 PSIG for a minimum of 15 minutes, the "HEAT RECOVERY LOSS OF PRESSURE" lamp shall illuminate. When the pressure rises above 18 PSIG the lamp shall turn off.
4. Heat Recovery Loss of Flow Alarm. When the heat recovery system flow rate drops below 10 GPM for a minimum of 15 minutes, the "HEAT RECOVERY LOSS OF FLOW" lamp shall illuminate. When the flow rate rises above 15 GPM the lamp shall turn off.
5. Recovered Heat Output. The PLC shall calculate the instantaneous rate of energy delivered based on the supply temperature, return temperature, and flow rate. A specific heat of 450 BTUH/GPM-F shall be used for the fluid.
6. Total Recovered Heat Delivered. The PLC shall calculate the total energy delivered in units of 100,000 BTU with no decimal places.
7. History. The PLC shall maintain a running total of energy delivered.

END OF WRITTEN SPECIFICATIONS

ATTACHMENT A, TYPICAL GENSET CONTROLLER SETTINGS TABLE (wset file)

ATTACHMENT B, DEMAND CONTROL AND ALARM SETPOINTS TABLES

SEE SEPARATELY BOUND PROJECT DESIGN DRAWINGS

Alarm Classes	Type 1 = Class B (Ezgn Warning) with PLC Assist to Start Another then Shutdown Type 2 = Class F (Open GCB & Immediate Shutdown) Type 3 = Class D (open GCB & cool down)

Home Screen data: Engine	RPM, Engine Hours, Oil Pressure, Battery Voltage, Coolant Temperature
: Generator	Volts, Power (kW), Freq, PF, AMPS - L1, L2, L3
Custom Screen 1	
Custom Screen 2	

Configure frequency control	**freq ctl init state**	**proportional gain**	**integral gain**
Frequency Control Initial State	0.5	1	1

Configure Active Power Load Share for Detroit Diesel Series 60	
Active Power Load Share 5531	ON
Active Power Load Share Gain 4522	

Configure general engine	**Time**	**Ign delay**	**Vlv delay**	**S/S mode**	**Pre-mode**
Preglow	5	5	5	Diesel	ALWAYS

Configure Analog Inputs	**Input**	**Type**	**Value**	**Sender**	**Self Ackn**	**Unit**	**Class***
Exhaust Temp	1	Linear	70-1400	0-20mA	No	F	B
~~Air Filter~~	~~2~~	~~Linear~~	~~-408 - 0~~	~~0-20mA~~	~~No~~	~~IWC~~	~~B~~
~~Intake Air Temp~~	~~3~~	~~Linear~~	~~20-240~~	~~0-20mA~~	~~No~~	~~F~~	~~B~~

Configure Analog OUTputs		**Type**	**Filter**	**Src Min**	**Src Max**	**Min Lvl**	**Max Lvl**	**PWM lvl**
Speed Bias	Out 1	V	Off	0	100	0.5	4.5	10V
Voltage Bias	Out 2	V	Off	0	100	-3	3	10V

Configure Discrete Inputs	**Input**	**Delay**	**Contact**	**Class**	**Enabled**	**Self Ackn**
E-Stop	1	0.2	N.O.	F	Always	No
Start in Auto	2	0.5	N.O.	Control	Always	No
Oil Level Switch (Alarm)	3	5	N.O.	B	Always	No
Oil Level Switch (SD)	4	100	N.O.	F	Always	No
Stop Mode Lockout Switch	5	0.5	N.O.	F	Always	**Yes**
Idle Mode / Spare / VFD Fault	6	0.5	N.O.	Control	Always	No
MCB Open Reply	7	0.5	N.O.	Control	Always	No
GCB Open Reply	8			-		
Remote Acknowledge	9	0.2	N.O.	Control	Always	No
Spare or Baseload	10	0.2	N.O.	Control	Always	No
PLC E-Stop / Master Shutdown	11	0.2	N.O.	F	Always	No
Run w/o Load or spare	12	0.2	N.O.	Control	Always	No

Configure Discr Outputs (relays)	**Relays Use Program Logic**

Configure external discrete Inputs		**Delay**	**Contact**	**Class**	**Enabled**	**Self Ackn**
~~Alarm Reset~~	~~1~~	~~0.05~~	~~N.O.~~	~~Control~~	~~Always~~	~~No~~
Air Filter Shutdown	2	60	N.O.	B	Always	No
~~Engine Service Alarm~~	~~7~~	~~0.05~~	~~N.O.~~	~~B~~	~~Always~~	~~Yes~~

Configure Ctrs/Service Reset value	250 or 300 or 500	

Configure Interfaces/CANopen	used with IKDs	

Configure Measurement				
Busbar / configure transformer	480V	10%	200V	480V
Engine	1800 rpm			
Generator	See Notes		L1 L2 L3	480V
Configure transformer	200V	480V	See Notes	
Mains	See Notes		Phase L1	480V
Configure transformer	200V	480V	See Notes	

Configure Monitoring	**Monitor**	**Class**	**Atmp/Ack**	**Time**	**Limit**	**Enabled**
Configure GCB	ON	B	5 tries	2s	--	--
Configure MCB	**OFF**					
Configure Synch GCB	ON	D	No	60s	--	--
Engine/Overspeed Level 2	ON	F	No	0.5s	1900rpm	Always
Engine/Speed Detection	ON	E	No	1s	--	Eng.mon
Engine/Start/Stop/SD malfunction	ON	F	No	30s	--	--
Engine/Start/Stop/Start Fail	ON	F	No	--	--	--
Engine/Start/Stop/Unintended stop	ON	F	No	--	--	--

Config Monitoring Flexible Limits	**Input**	**Monitor**	**Class**	**Self Ackn**	**Enabled**	**Monitor**	**Limit**	**Delay**
~~Exhaust Temp SD~~	~~1~~	~~OFF~~	~~F~~	~~No~~	~~Always~~	~~Overrun~~	~~950F~~	~~30~~
Exhaust Temp Alarm	2	ON	A	No	Always	Overrun	900F / 482C	30
~~Air Filter Restriction SD~~	~~3~~	~~ON~~	~~F~~	~~No~~	~~Always~~	~~Underrun~~	~~20" WC/ 1.47" Hg~~	~~30~~
~~Air Filter Restriction Alarm~~	~~4~~	~~ON~~	~~B~~	~~No~~	~~Always~~	~~Underrun~~	~~15" WC/ 1.10" Hg~~	~~60~~
~~High Intake Air SD (CAC)~~	~~5~~	~~ON~~	~~F~~	~~No~~	~~87.70 LM:Eng.mon~~	~~Overrun~~	~~150F~~	~~30~~
~~High Intake Air Alarm (CAC)~~	~~6~~	~~ON~~	~~B~~	~~No~~	~~87.70 LM:Eng.mon~~	~~Overrun~~	~~140F~~	~~30~~
Low Oil Pressure SD	7	ON	F	No	87.70 LM:Eng.mon	Underrun	10PSI/69kPa	5
Low Oil Pressure Alarm	8	ON	B	No	87.70 LM:Eng.mon	Underrun	14.5PSI/100kPa	5
High Coolant Temp SD	9	ON	F	No	Always	Overrun	215F / 102C	30
High Coolant Temp Alarm	10	ON	B	No	Always	Overrun	210F / 99C	30
Running Timeout	11	ON	F	No	Always	Overrun	300s	1
setpoints may be either Metric or ANSI units								

Config Monitoring Generator		**Monitor**	**Class**	**Self Ackn**	**Enabled**	**Limit**	**Delay (sec)**	**Rest / Hyst**
Current/OC Level 1	--	ON	D	No	Always	100%	3	No
Current/OC Level 2	--	ON	D	No	Always	120%	1	No
Current/OC Level 3	--	ON	D	No	Always	250%	0.4	No
Frequency/OF Level 2	--	ON	D	No	Always	103%	5	--
Frequency/UF Level 2	--	ON	D	No	Eng.mon	97%	5	--
Operating Ranges	--	OFF	--	--	--	--	--	--
Other Monitoring/Phase rotation	--	ON	F	No	Always	--	--	CW
Other Monitoring/Power factor	--	OFF	--	--	--	--	--	--
Power/Load Share	--	OFF	--	--	--	--	--	--
Power/Overload	--	OFF	--	--	--	--	--	--
Power/Power Mismatch	--	ON	B	No		5%	30	--
Power/Gen Unloading mismatch	--	ON	B	No		5%	60	--
Power/Rev / Reverse power level 2	--	ON	D	No	Always	-10%	5	--
Power/Unbal Load	--	OFF	--	--	--	--	--	--
Power/Volt/OV Level 2	--	ON	D	No	Always	110%	5	--
Power/Volt/UV Level 2	--	ON	D	No	Eng.mon	90%	5	--
Mains		OFF??						

Miscellaneous/Free Alarms	**Alarm**	**Class**	**Self Ackn**	**Enabled**	**Monitor**	**Delay**
Oil Level AL	1	B	No	Always	Disc Inp 3	5
Oil Level SD	2	F	No	Always	Disc Inp 3	100

Miscellaneous/Interfaces		**Monitor**	**Class**	**Self Ackn**	**Enabled**	**Delay**
CAN Interface 2	--	ON	B	Yes	Always	0.2
J1939 Amber Alarm	--	OFF	A	No	Always	2
J1939 DM1 alarms	--	OFF	--	Yes	--	--
J1939 Interface (Device 1-3)	--	OFF	--	--	--	--
J1939 Red Alarm	--	OFF	F	No	Always	2

NOTES:

Engine Speed Source

Generator/Engine

Custom Program or Turn off button
Custom Program or Turn off button

5508/5510/5511: use default settings for John Deere

5531/4522: use default settings for John Deere
5531/4522: use default settings for John Deere

powers up ECM 5 seconds before cranking to prime fuel system

* Monitor Wire Break/Signal Loss - High/Low

Sender value 4-20mA, Alarm Only No Shut Down
Not Used - See External Discrete Input 2
Not Used Except in Ruby (Only Site with Charge Air Coolers)

JD:Type=V; Min/Max=0.5/4.5
DECS 100 Bias: +/- 3V

Spare
when stop switch set to RUN, easygen remains in STOP Mode
Class: Idle Mode = Control, VFD Fault = Class B
DI7 Jumpered for Islanded System
non configurable

Flexible Limit 11 used for Running Timeout
DI11 triggers EasyGen "Master Shutdown" alarm, indicates from Master Section
DI12 keeps gen from closing to bus when bus is dead and SMS is not in auto

refer to easygen terminal diagram for function

typically used when door-mounted pushbuttons provide easygen input
IKD Input 1 resets EasyGen alarms
IKD Input 2 performs Type 1 shutdown for plugged air filter
IKD Input 7 performs Type 1 shutdown for Engine Service interval

Verify with Operator if 250hr / 300hr or 500 hr Oil Change Interval

15320 Select ext terminals

verify Bus PT is 2.4 or 4:1 (2.4=200V, 4=120V)
Set 1752 and 1758 (kW/kVar) based on Generator Prime Rating
1754 (rated current) set based on Gen Conductor Ampacity
1800: Confirm PT ratio 2.4:1; 1806: Primary Rated Current = CT ratio
Set rated kvar, kW & rated current = sum of Gen Prime Ratings
1803: Confirm PT ratio 2.4:1; 1807: Mains Rated Current = CT ratio

spare, Not Used - easygen does not shutdown engine on high ex temp

Not Used - See External Discrete Input 2
Not Used - See External Discrete Input 2
Not Used Except in Ruby (Only Site with Charge Air Coolers)
Not Used Except in Ruby (Only Site with Charge Air Coolers)
UNITS are kPa
UNITS are kPa
UNITS are C
UNITS are C

used when genset is in Baseload
60s min delay, 180s max delay

input from DI3
input from DI3

16187 CAN2 Monitoring
15120 J1939 Monitoring
15156 J1939 Monitoring
1919 Monitoring
15115 Monitoring

NIKOLSKI

Demand Control Table (PLC)				
Demand Control	Generator(s) On Line	On-line kW (Overload)	Level Increase	Level Decrease
Level 1	#3	37	30	---
Level 2	#1 or #2	65	55	25
Level 3	#3 & #1 or #2	102	90	45
Level 4	All	167	---	80
Note : Gen #1 & #2 are equal capacity. Manually select lead unit.				

Engine-Generator Alarm Settings (EZGN Genset Controller)			
Function	Normal Range	Alarm	Shut Down
Overspeed	1795-1805	----	1900 RPM
Oil Pressure	30-50 PSI	14.5 PSI	10 PSI
Coolant Temp.	180-200°F	210°F	215°F
Exhaust Temp.	500-850°F	900°F	-----
Under Frequency	59.5-60.5 Hz	----	58.2 Hz
Over Frequency	59.5-60.5 Hz	----	61.8 Hz
Under Voltage	470-490 V	----	432 V
Over Voltage	470-490 V	----	528 V
Reverse Power	0	----	10%

Generator Breaker Settings (EZGN Genset Controller)	
Function	Setting
Gen #1 Breaker Trip Setpoint (EZGN Rated Current)	175 A
Gen #2 Breaker Trip Setpoint (EZGN Rated Current)	175 A
Gen #3 Breaker Trip Setpoint (EZGN Rated Current)	90 A
Gen Breaker Level 1 (100%) Time Over Current	3 sec.
Gen Breaker Level 2 (120%) Time Over Current	1 sec.
Gen Breaker Level 3 (250%) Time Over Current	0.4 sec.

Feeder Breaker Settings (Feeder Protection Relay - FPR)
No FPR – Thermal Trip Plug Only

RUBY

Demand Control Table (PLC)				
Demand Control	Generator(s) On Line	On-line kW (Overload)	Level Increase	Level Decrease
Level 1	#3	100	90	---
Level 2	#2	160	144	80
Level 3	#1	200	180	128
Level 4	All	460	---	160

Engine-Generator Alarm Settings (EZGN Genset Controller)			
Function	Normal Range	Alarm	Shut Down
Overspeed	1795-1805	----	1900 RPM
Oil Pressure	30-50 PSI	14.5 PSI	10 PSI
Coolant Temp.	180-200°F	210°F	215°F
Exhaust Temp.	500-850°F	900°F	-----
Charge Air Temp.	100-120°F	140°F	150°F
Under Frequency	59.5-60.5 Hz	----	58.2 Hz
Over Frequency	59.5-60.5 Hz	----	61.8 Hz
Under Voltage	470-490 V	----	432 V
Over Voltage	470-490 V	----	528 V
Reverse Power	0	----	10%

Generator Breaker Settings (EZGN Genset Controller)	
Function	Setting
Gen #1 Breaker Trip Setpoint (EZGN Rated Current)	300 A
Gen #2 Breaker Trip Setpoint (EZGN Rated Current)	250 A
Gen #3 Breaker Trip Setpoint (EZGN Rated Current)	250 A
Gen Breaker Level 1 (100%) Time Over Current	3 sec.
Gen Breaker Level 2 (120%) Time Over Current	1 sec.
Gen Breaker Level 3 (250%) Time Over Current	0.4 sec.

Feeder Breaker Settings (Feeder Protection Relay - FPR)
No FPR – Thermal Trip Plug Only

AKIAK

Demand Control Table (PLC)				
Demand Control	Generator(s) On Line	On-line kW (Overload)	Level Increase	Level Decrease
Level 1	1 Generator	210	190	---
Level 2	2 Generators	420	380	170
Level 3	3 Generators	630	---	340
Note: All generators are equal capacity. Manually select priority for each.				

Engine-Generator Alarm Settings (EZGN Genset Controller)			
Function	Normal Range	Alarm	Shut Down
Overspeed	1795-1805	----	1900 RPM
Oil Pressure	30-50 PSI	14.5 PSI	10 PSI
Coolant Temp.	180-200°F	210°F	215°F
Exhaust Temp.	500-850°F	900°F	-----
Under Frequency	59.5-60.5 Hz	----	58.2 Hz
Over Frequency	59.5-60.5 Hz	----	61.8 Hz
Under Voltage	470-490 V	----	432 V
Over Voltage	470-490 V	----	528 V
Reverse Power	0	----	10%

Generator Breaker Settings (EZGN Genset Controller)	
Function	Setting
Generator Breaker Trip Setpoint (EZGN Rated Current)	330 A
Gen Breaker Level 1 (100%) Time Over Current	3 sec.
Gen Breaker Level 2 (120%) Time Over Current	1 sec.
Gen Breaker Level 3 (250%) Time Over Current	0.4 sec.

Feeder Breaker Settings (Feeder Protection Relay - FPR)	
Function (Note: Element 1 is the only active element)	Setting
T.O.C. Trip Pickup (amps) Note: 5A = 100% of CT rating	2.75
T.O.C. Curve Selection	U4
T.O.C. Time Dial	5.00
E.M Reset delay (Y/N)	N
Constant Time Adder (seconds)	0.00
Minimum Response Time (seconds)	0.00
Maximum Phase T.O.C. Torque Control	1

SAINT GEORGE

Demand Control Table (PLC)				
Demand Control	Generator(s) On Line	On-line kW (Overload)	Level Increase	Level Decrease
Level 1	1 Generator	210	190	---
Level 2	2 Generators	420	380	170
Level 3	3 Generators	630	---	340
Note: All generators are equal capacity. Manually select priority for each.				

Engine-Generator Alarm Settings (EZGN Genset Controller)			
Function	Normal Range	Alarm	Shut Down
Overspeed	1795-1805	----	1900 RPM
Oil Pressure	30-50 PSI	14.5 PSI	10 PSI
Coolant Temp.	180-200°F	210°F	215°F
Exhaust Temp.	500-850°F	900°F	-----
Under Frequency	59.5-60.5 Hz	----	58.2 Hz
Over Frequency	59.5-60.5 Hz	----	61.8 Hz
Under Voltage	470-490 V	----	432 V
Over Voltage	470-490 V	----	528 V
Reverse Power	0	----	10%

Generator Breaker Settings (EZGN Genset Controller)	
Function	Setting
Generator Breaker Trip Setpoint (EZGN Rated Current)	400 A
Gen Breaker Level 1 (100%) Time Over Current	3 sec.
Gen Breaker Level 2 (120%) Time Over Current	1 sec.
Gen Breaker Level 3 (250%) Time Over Current	0.4 sec.

Feeder Breaker Settings (Feeder Protection Relay - FPR) Two Identical Feeders	
Function (Note: Element 1 is the only active element)	Setting
T.O.C. Trip Pickup (amps) Note: 5A = 100% of CT rating	3.3
T.O.C. Curve Selection	U4
T.O.C. Time Dial	5.00
E.M Reset delay (Y/N)	N
Constant Time Adder (seconds)	0.00
Minimum Response Time (seconds)	0.00
Maximum Phase T.O.C. Torque Control	1

LARSEN BAY DIESEL

Demand Control Table (PLC)				
Demand Control	Generator(s) On Line	On-line kW (Overload)	Level Increase	Level Decrease
Level 1	#2 or #3	65	55	---
Level 2	#2 & #3	130	110	45
Level 3	#1	210	190	90
Level 4	#1 & #2 or #3	275	---	170

Note : Gen #2 & #3 are equal capacity. Manually select lead unit.

Engine-Generator Alarm Settings (EZGN Genset Controller)			
Function	Normal Range	Alarm	Shut Down
Overspeed	1795-1805	----	1900 RPM
Oil Pressure	30-50 PSI	14.5 PSI	10 PSI
Coolant Temp.	180-200°F	210°F	215°F
Exhaust Temp.	500-850°F	900°F	-----
Under Frequency	59.5-60.5 Hz	----	58.2 Hz
Over Frequency	59.5-60.5 Hz	----	61.8 Hz
Under Voltage	470-490 V	----	432 V
Over Voltage	470-490 V	----	528 V
Reverse Power	0	----	10%

Generator Breaker Settings (EZGN Genset Controller)	
Function	Setting
Gen #1 Breaker Trip Setpoint (EZGN Rated Current)	390 A
Gen #2 Breaker Trip Setpoint (EZGN Rated Current)	130 A
Gen #3 Breaker Trip Setpoint (EZGN Rated Current)	130 A
Gen Breaker Level 1 (100%) Time Over Current	3 sec.
Gen Breaker Level 2 (120%) Time Over Current	1 sec.
Gen Breaker Level 3 (250%) Time Over Current	0.4 sec.

Feeder Breaker Settings (Feeder Protection Relay - FPR)	
Function (Note: Element 1 is the only active element)	Setting
T.O.C. Trip Pickup (amps) Note: 5A = 100% of CT rating	3.75
T.O.C. Curve Selection	U4
T.O.C. Time Dial	5.00
E.M Reset delay (Y/N)	N
Constant Time Adder (seconds)	0.00
Minimum Response Time (seconds)	0.00
Maximum Phase T.O.C. Torque Control	1

DEERING

Demand Control Table (PLC)				
Demand Control	Generator(s) On Line	On-line kW (Overload)	Level Increase	Level Decrease
Level 1	#1	100	90	---
Level 2	#2 & #3	170	150	80
Level 3	#4	210	190	135
Level 4	#4 & #1 or #2	310	---	250
Note : Gen #2 & #3 are equal capacity. Manually select lead unit.				

Engine-Generator Alarm Settings (EZGN Genset Controller)			
Function	Normal Range	Alarm	Shut Down
Overspeed	1795-1805	----	1900 RPM
Oil Pressure	30-50 PSI	14.5 PSI	10 PSI
Coolant Temp.	180-200°F	210°F	215°F
Exhaust Temp.	500-850°F	900°F	-----
Under Frequency	59.5-60.5 Hz	----	58.2 Hz
Over Frequency	59.5-60.5 Hz	----	61.8 Hz
Under Voltage	470-490 V	----	432 V
Over Voltage	470-490 V	----	528 V
Reverse Power	0	----	10%

Generator Breaker Settings (EZGN Genset Controller)	
Function	Setting
Gen #1 Breaker Trip Setpoint (EZGN Rated Current)	150 A
Gen #2 Breaker Trip Setpoint (EZGN Rated Current)	225 A
Gen #3 Breaker Trip Setpoint (EZGN Rated Current)	300 A
Gen #4 Breaker Trip Setpoint (EZGN Rated Current)	300 A
Gen Breaker Level 1 (100%) Time Over Current	3 sec.
Gen Breaker Level 2 (120%) Time Over Current	1 sec.
Gen Breaker Level 3 (250%) Time Over Current	0.4 sec.

Feeder Breaker Settings (Feeder Protection Relay - FPR)
No FPR – Thermal Trip Plug Only

SECTION 26 23 05

SCADA SYSTEM FOR PRIME POWER SWITCHGEAR

PART 1 - GENERAL

1.1 SCOPE

A. The Work consists of providing a complete and operational Supervisory Control and Data Acquisition (SCADA) and Historical Trending system, as specified herein. The SCADA system shall be provided by an experienced programmer, referred to as Developer.

B. The Developer shall develop the SCADA system and programming for the Human Machine Interface (HMI), referred to herein as Operator Interface Unit (OIU), data storage server, and local and remote devices. The SCADA system shall include Supervisory and Trending application software, custom project software file(s), and other software and files required to make a complete and fully functional system.

C. The Developer shall provide all labor, equipment, incidentals and resources as specified and needed to furnish, program, install, calibrate, test, start-up and commission, and place into service a complete SCADA system, as indicated herein.

D. The Authority and Utility, herein referred to as Designee(s), shall maintain ownership and use of all custom project software files and documentation developed to meet the requirements of this solicitation. All SCADA Supervisory and Trending application software licenses provided under this solicitation shall include the legal right for the Authority and its Designee(s) to use the software for an indefinite period of time without additional cost (perpetual license). The Authority and its Designee(s) shall have unlimited rights to install and operate the SCADA Supervisory and Trending application software, up to the number of software licenses issued, and to install, operate and modify the custom project files as needed, without the requirement to commit to on-going maintenance or service agreements.

E. The Developer shall fully test the SCADA system with the switchgear and generating equipment as specified herein and in Section 26 23 02 - Upgrade Existing Prime Power Switchgear.

F. In addition to the specified requirements for SCADA system programming, testing, commissioning, and warranty work, during the one-year warranty period the Developer shall provide an additional twelve (12) hours of programming assistance and technical support to modify the SCADA as requested by the Authority or its Designee(s). These hours are in addition to any technical requirements specified for programming, start-up, and commissioning efforts, and shall be included in the Developer's bid price. The programming assistance and technical support may be required to be provided at a single event or may be spread out over the year as directed by the Authority or its Designee(s), and will be performed remotely from the Developer's office and not at the Utility location. Note that the 12 hours is for the entire project, not 12 hours per community.

1.2 RELATED REQUIREMENTS

A. Section 26 05 00 Common Work Results for Electrical

B. Section 26 05 02 Basic Electrical Materials and Methods

C. Section 26 23 02 Upgrade Existing Prime Power Switchgear

1.3 SUBMITTALS

A. Provide submittals in accordance with Section 26 05 00 Common Work Results for Electrical and Division 1.

B. Submit data sheets and catalog data showing all supplied features, options and configurations of the SCADA Supervisory and Trending application software. Include SCADA platform version, and Visualization, Drivers and Trending modules.

C. Submit specific software operating system and version, and quantity of licenses for each of the following: OIU, data storage server, local and remote devices, and SCADA Supervisory and Trending application.

D. Provide a written narrative that describes the purpose and function of each device and the method of communication, i.e., LAN/EtherNet/ModbusTCP/CAN BUS/etc.

E. Provide a written narrative that describes the methods/protocols available to access the SCADA system both on the local area network (LAN) and remotely via the internet wide area network (WAN), and how many users may simultaneously access the SCADA system (LAN and WAN).

F. Provide a written description of the SCADA system security encryption and authentication protocol.

G. Submit screen shots of the proposed OIU screen custom project file(s). Provide a Tag list and narrative operating description of the project file(s).

1.4 SCADA SYSTEM SOFTWARE

A. All SCADA Supervisory and Trending application software licenses and custom project files, as well as upgrades and maintenance described in the Warranty herein, shall be included in the Developer's bid price. The SCADA and Trending system shall use non-proprietary software and have integrated real-time monitoring with Alarm and Historical graphing.

For the purpose of this solicitation the SCADA Supervisory application software is defined as:

- Machine-readable object code used for the supervision, control and monitoring of the programmable logic controller (PLC) and other switchgear and field devices. The Supervisory application software interacts with custom project file(s) that are configured and customized to display and control tags from the PLC and devices, as indicated in Section 26 23 02 - Upgrade Existing Prime Power Switchgear.

For the purposes of this solicitation the SCADA Trending application software is defined as:

- Software that provides the functions as described in Paragraph 2.2 - Trending

B. For the SCADA system to function both the Supervisory application software and custom project files shall be installed on a client device. A client device shall include, but not be limited to, devices that operate on Windows 10, Windows 11, Windows Enterprise IoT 2016 or later, and excludes any Windows-based Server.

C. The Authority and its Designee(s) shall be able to upgrade the Supervisory and Trending application software and to edit, modify, change, and manipulate the custom project files to fit their requirements.

D. The Authority shall own outright all other software applications and files developed under this solicitation by the Developer without license and shall have full rights to the files and programming code and may distribute, modify, or install it on any number of computers that may be owned by the Authority or its Designee(s) without additional costs or fees, up to the number of software licenses issued.

E. For the purposes of this contract "other software applications and files" shall include but may not be limited to:

- Customized screens and parameters developed for use with the Supervisory and Trending application software. (i.e., custom project files).
- Any other software and interfaces developed between the Supervisory and Trending application software, custom project files, and other application software and files related to collecting and reporting power plant data via the SCADA system.

1.5 QUALITY ASSURANCE

A. The Developer is responsible for quality assurance and completion of all work identified in these specifications. All work shall be subject to evaluation and inspection by the Authority at all times to assure satisfactory progress, and to verify that work is being performed in accordance with the specifications.

B. The SCADA system shall be furnished by a single Developer who shall assume all responsibility for providing a complete and integrated SCADA system.

1.6 DEVELOPER QUALIFICATIONS

A. The SCADA system shall be the product of a Developer who can demonstrate at least five (5) years of continuous satisfactory experience in designing, implementing, furnishing and installing comparable SCADA systems for remote installations.

B. The Developer shall have a thorough working knowledge of remote, off-grid prime power electric power plant controls and operating practices.

C. 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 Developer qualifications. The list shall include installation date, description of installation, and a reference contact for each installation.

1.7 DEVELOPER WARRANTY

A. The Developer shall warrant the work for a period of not less than one-year. The warranty period shall commence upon acceptance by AEA of field testing with the engine generators and final commissioning of the equipment.

B. In the event of a failure of the system to perform all specified functions during the warranty period, the Developer shall promptly repair or replace any defective components and revise programming and settings as required to achieve full system function. The Developer shall assist the Authority as directed in determining causes of deficiency or failure.

C. The Developer shall Provide additional programming assistance and technical support during the one-year warranty period as previously specified.

1.8 OPERATION AND MAINTENANCE MANUALS

A. See Section 26 23 02 - Upgrade Existing Prime Power Switchgear.

PART 2 - PRODUCTS

2.1 GENERAL

A. The Developer shall provide a fully functional SCADA system as specified herein and to meet the requirements of Section 26 23 02 - Upgrade Existing Prime Power Switchgear.

B. The SCADA system shall be compatible with the switchgear hardware.

C. The SCADA system may depend on external hardware or software for program setup, activation, and periodic automatic software updates, but shall not require or be dependent on internet access to function properly on the power plant LAN.

D. The Supervisory system shall operate on the specified Data Storage Server and read information directly from the PLC, and switchgear and power plant devices via the power plant LAN.

E. The Supervisory system shall not be dependent on connectivity to the internet or to any Windows-based server to function properly.

F. The SCADA system shall be accessible via remote and local devices operating on Microsoft Windows 10 or 11 operating systems.

G. The Trending software shall be fully integrated into the Supervisory program. Separate Supervisory/Trending programs are not acceptable. Inductive Automation or approved equal with the following minimum components:

1. Ignition 8.1 Platform and Drivers.
2. Vision Module Unlimited.
3. Tag Historian Module.

H. Multiple applications of the SCADA system shall run concurrently. The OIU screens, alarms and monitoring points shall be identical for all SCADA applications, regardless if accessed locally or remotely via the internet. The Developer shall provide a sufficient quantity of SCADA and Trending application

software licenses such that all devices in the power plant, and no less than three (3) additional remote (via WAN) and/or local (via LAN) devices, shall be authorized to access the SCADA system concurrently (5 software licenses, minimum).

I. The Supervisory and Trending application software and custom project file(s) shall be relatively small in size and have a simple installation routine. The SCADA system and software installation shall tolerate low throughput and high latency connections.

J. The OIU graphic interface shall be user friendly and have the capability without modification or setup to allow personnel with large fingers to use the touch screen without a mouse or keyboard.

K. The Supervisory system shall start and stop engines, reset alarms, change demand levels and have a confirm action dialog box for critical functions.

L. The Supervisory system shall maintain a log for all Warning Alarms and Shutdowns, refer to 3.3.K – Alarm History Screen.

M. The Developer shall maintain a secure FTP or web site with custom project files. Tag lists, installation and operating instructions, and other files necessary to install and operate the SCADA system, readily available to be downloaded and installed.

N. The Developer shall provide comments in the code that describe the function of each parameter for ease of future maintenance and changes.

O. The SCADA system installation, setup and modification shall be capable of being performed remotely via internet access.

P. Provide secure encryption with password protection.

2.2 TRENDING

A. The Developer shall provide, configure, test and implement a historical database on the switchgear data storage server for historical data (tag) archiving, analysis, reporting, trending and system back-up of ALL data presented by the SCADA system. All historical data shall be fully synchronized and time-stamped, using a single time series (clock), so that historical data from all monitored devices are compared to a single time series. The time and date shall be displayed on the SCADA Status tab.

B. The SCADA system shall include features for the management of historical data. The SCADA system shall record historical values of analog variables on a periodic basis (minimum 1 second interval) and values of digital variables on an event basis (change of state). The historical database must be capable of storing a minimum of one (1) year of historical data. All historical data shall be recorded on the switchgear data storage server. Historical files more than one (1) year old shall be automatically deleted.

C. Trending data from the historical database shall be displayed graphically on the SCADA Trending tab. Graphical data shall be available for all SCADA tags, and be accessible and exportable both locally and remotely via the internet WAN. The section of the trend to be exported shall be selectable by clicking and dragging the mouse across the trend, or by manually adjusting the start and end time of the

selected data. Any portion of the historical database shall be exportable. Data shall be exported to CSV or TXT formatted files, or similar file system as approved by the Authority. Exported files shall be of a manageable size compatible with the internet requirements of Paragraph 2.1. Exported trend data shall be readily capable of being printed or plotted to Adobe pdf format or to a designated printer.

D. Refer to Paragraph 3.4, Trending Application Tags, for representative example of historical data to be archived and available for trending.

2.3 SECURITY

A. Password Protection. Provide at a minimum the following access password protection:

1. Viewing only. In this level of access the viewer will be able to view the SCADA system but will not be able to modify any file or setpoint. Note remote WAN access shall be limited to Viewing only.

2. Local Operator. This level of access is for the local power plant operator. The operator will be able to change the demand levels and timers, change the lead generators, remote start and stop engines, and perform other functions as directed by the Authority. Note local Operator access shall be restricted to LAN access only. The Local Operator password shall be automatically entered each time the OIU/SCADA starts/reboots.

3. Administrator. This level of access is for SCADA Programming, the viewer will be able to control and change all SCADA features and functions.

B. The Developer shall provide a description of the SCADA system security encryption and authentication protocol for review and approval.

C. The Authority will provide a list of usernames and passwords for the Developer to install on the system.

D. The Authority will provide a list of I.P. Addresses and Subnet Masks for the Developer to assign to all devices on the LAN.

PART 3 - EXECUTION

3.1 SHOP TESTS

A. Prior to shop testing of the switchgear, the SCADA Supervisory system shall be fully functional as specified in Section 26 23 02 - Upgrade Existing Prime Power Switchgear.

B. The switchgear control system shall be tested using the SCADA Supervisory system as specified herein.

C. The OIU shall be fully functional and the switchgear shall be tested using the OIU. All alarm, indication, and control functions specified shall be available and indicated on the OIU.

D. The SCADA Trending application shall be shop tested to the extent practicable. Refer to Section 01 11 13 – Summary of Work for functional testing and commissioning requirements.

3.2 CUSTOMER TRAINING

A. The Developer shall provide a minimum of 4 hours of training for the Authority and Utility personnel for each community.

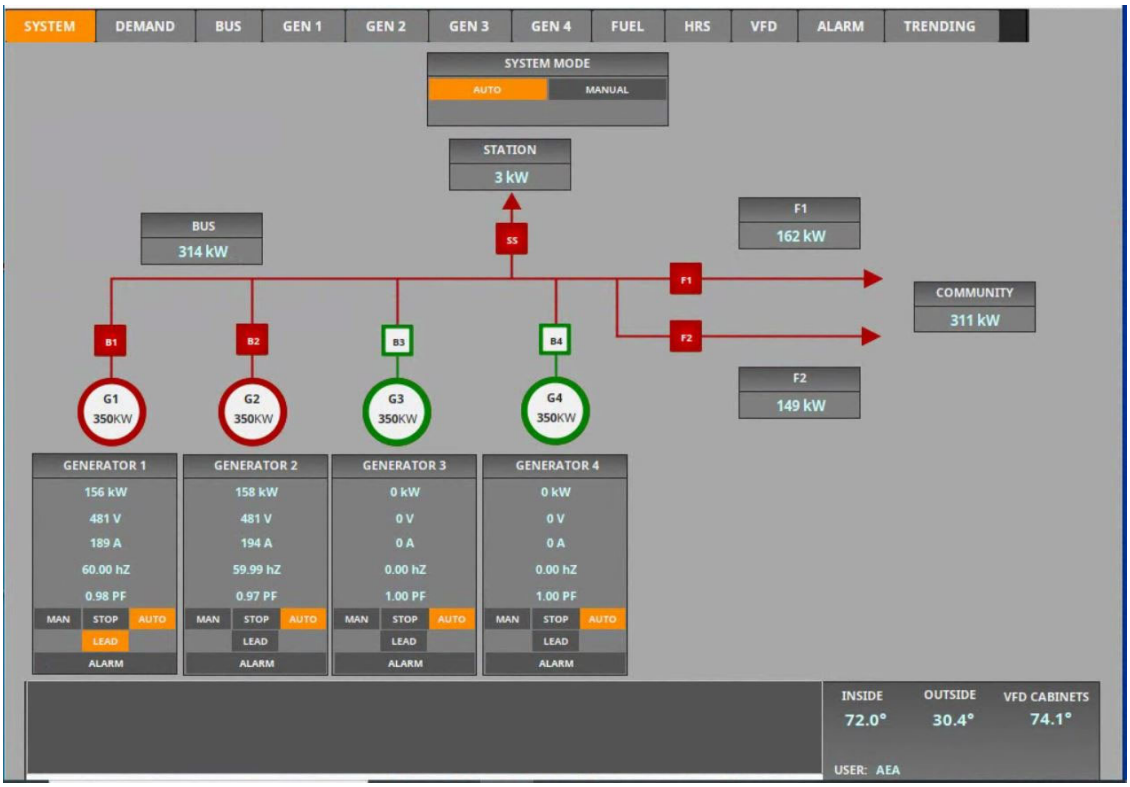
B. Training shall occur after substantial completion of the project using the actual power plant equipment. Coordinate with the Authority and Utility to ensure that the appropriate individuals are available.

C. During training, make modifications to the SCADA system programming as directed by the Authority to incorporate any system control modifications identified during testing, start-up, or commissioning.

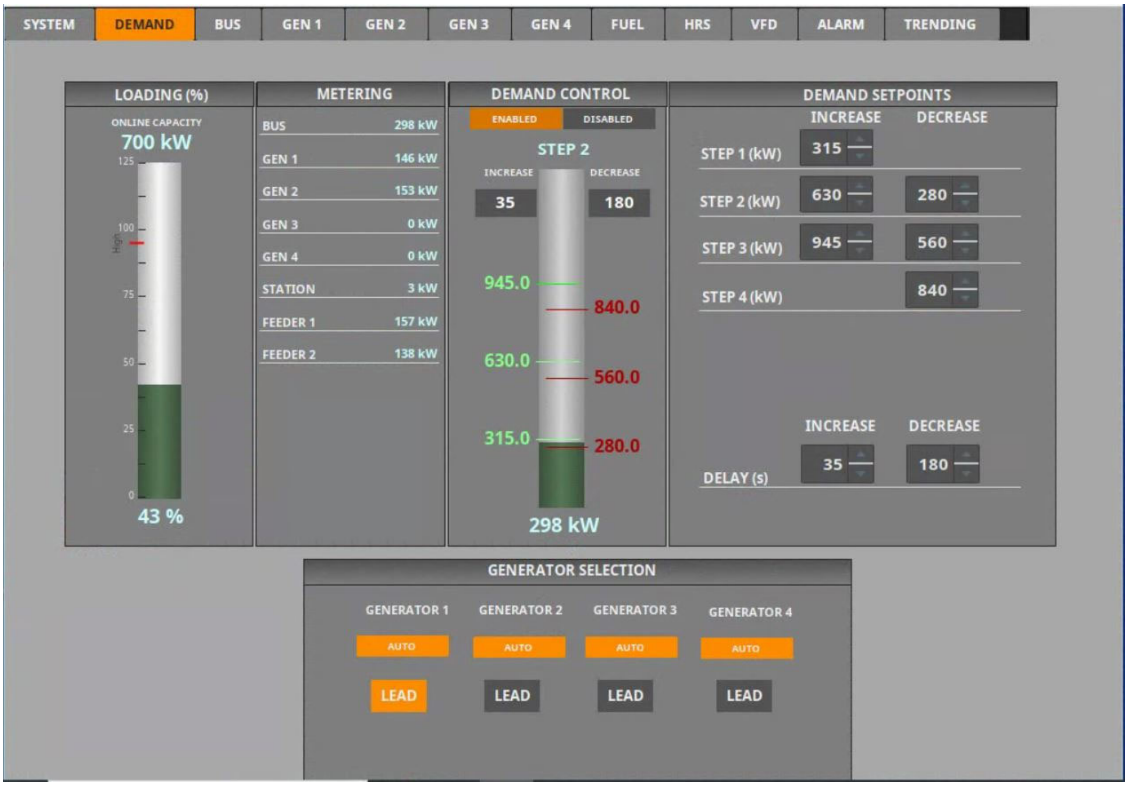
3.3 OIU SCREEN IMAGES

The SCADA system screens shall display all data as specified in Section 26 23 02 - Upgrade Existing Prime Power Switchgear. At a minimum, the Developer shall provide screens similar to the images shown in following paragraphs. The screen images are representative of the minimum data required and the desired format. The screens shall be identical whether accessed from the Master Section OIU, local PC’s/Devices connected to the LAN, or remote PC’s/Devices connected via the internet.

A. Home Screen – Overall Plant Status:



B. Demand Control Screen:

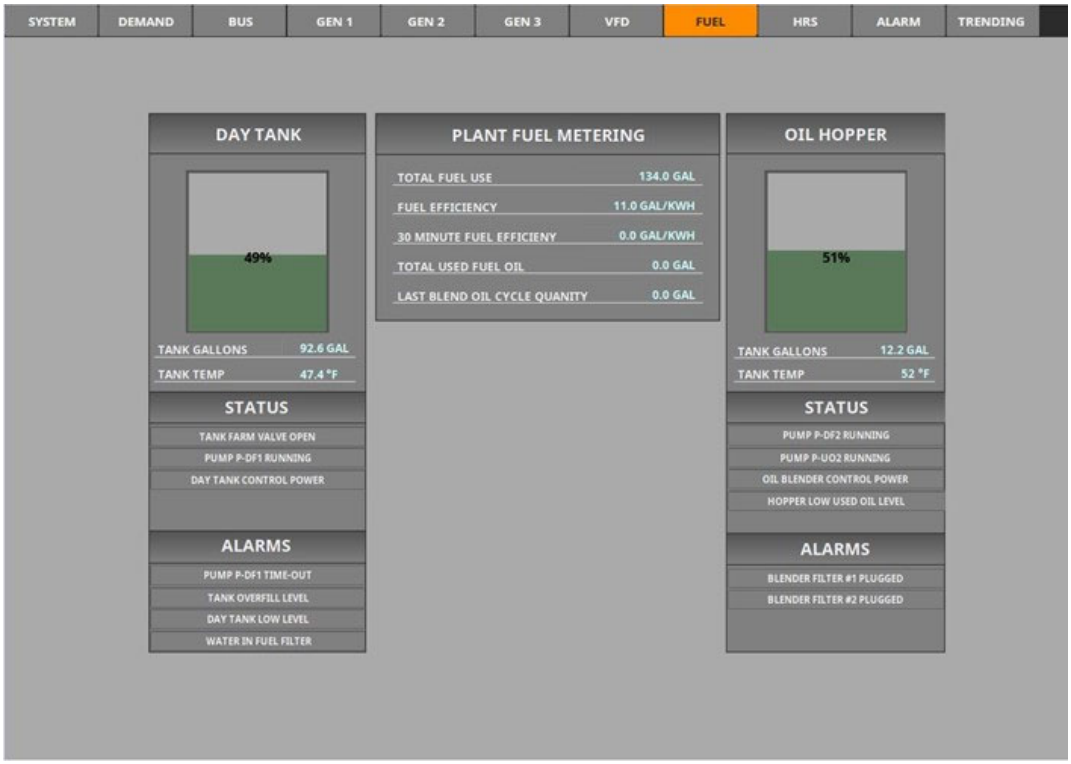


C. Bus/Master Monitoring & Metering Screen:

D. Engine-Generator Screen (for engines without charge air cooler):

E. Engine-Generator Screen (for engines with charge air cooler):

F. Fuel System Monitoring & Alarm Screen: *where applicable*



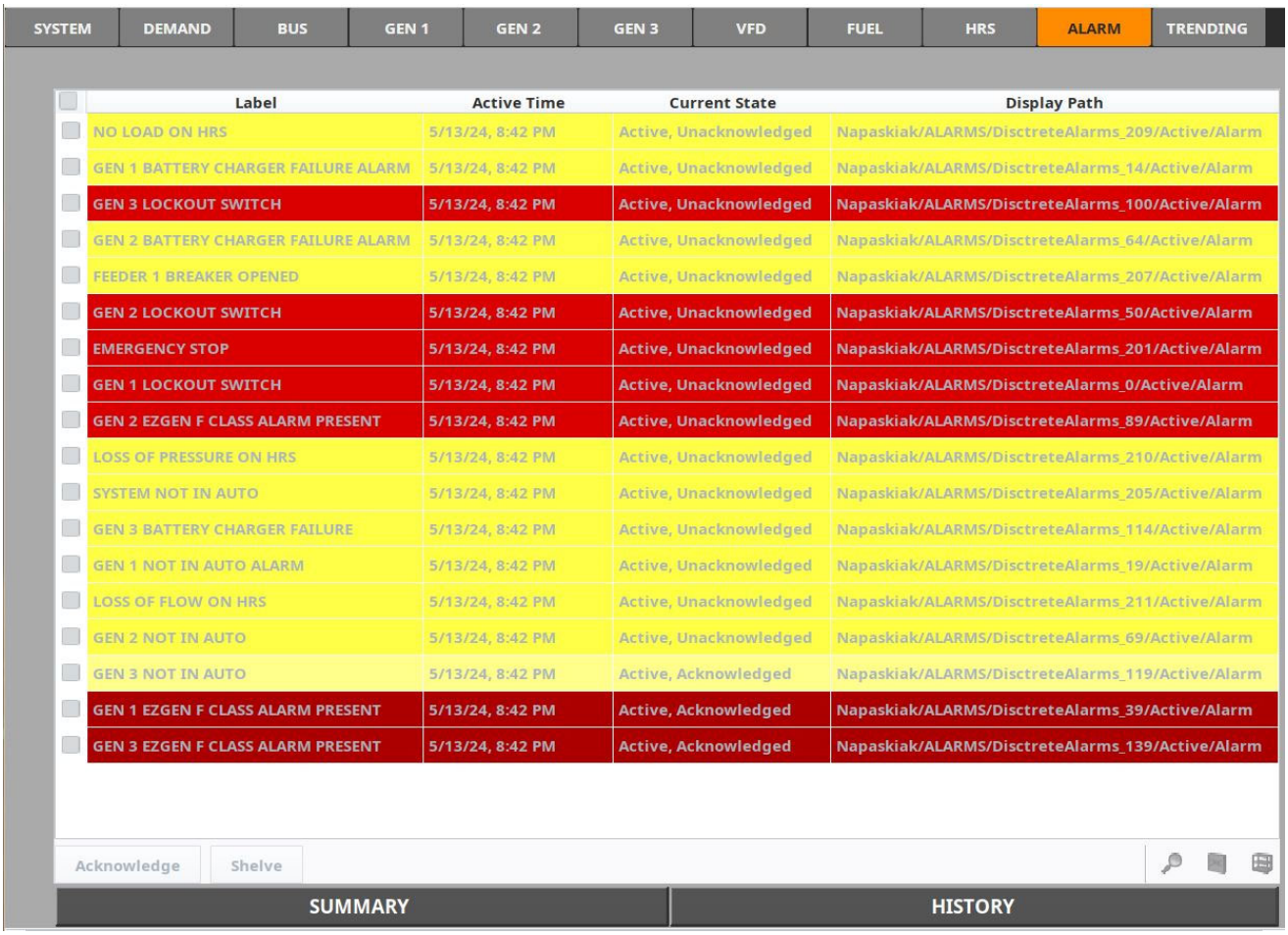
G. Heat Recovery Monitoring & Metering Screen: *where applicable*

H. Variable Frequency Drive (VFD) Monitoring Screen:

I. Alarm History Screen: Provide an Alarm History Screen for all Warning Alarms and Shutdowns delineated as follows:

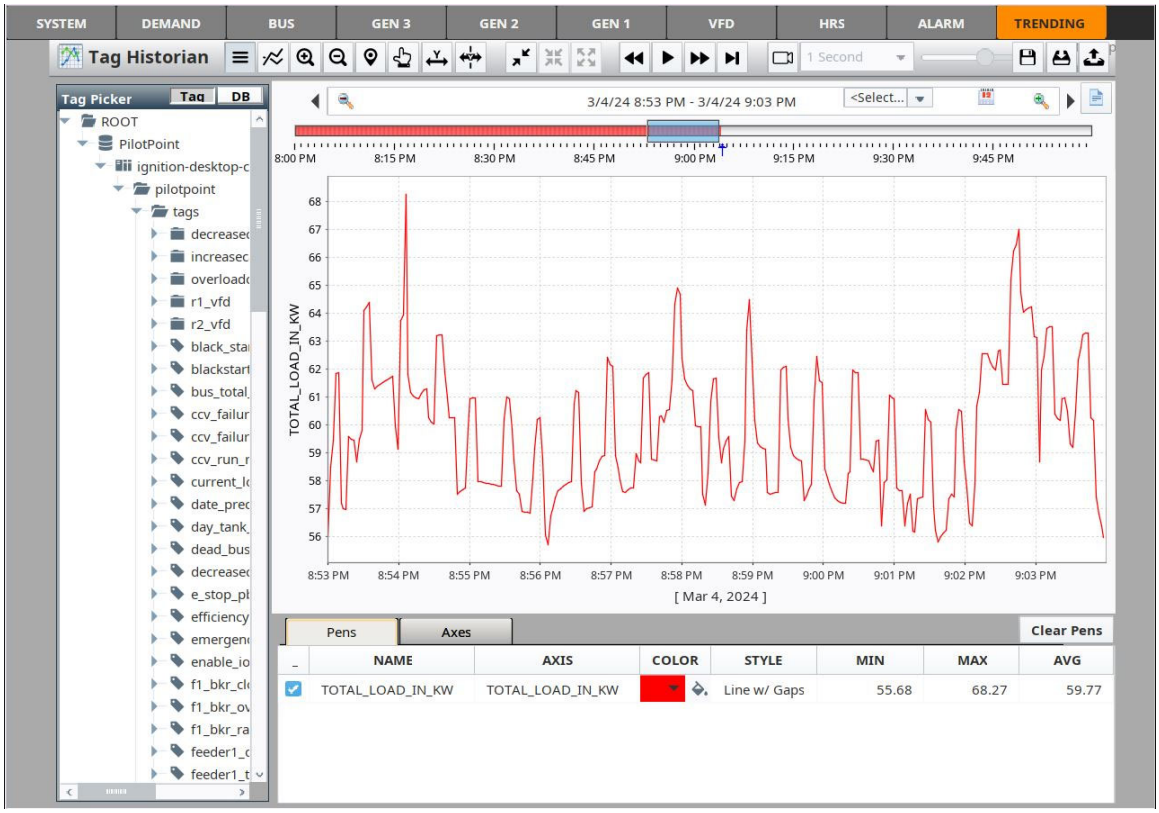
1. Warning Alarms shall include all Type 1 Engine Soft Shutdown Alarms and the following Master Section Alarms: Low Fuel Level, PLC/ Point I/O, System Not In Auto, and Feeder Breaker Trip. Warning Alarms shall be yellow.

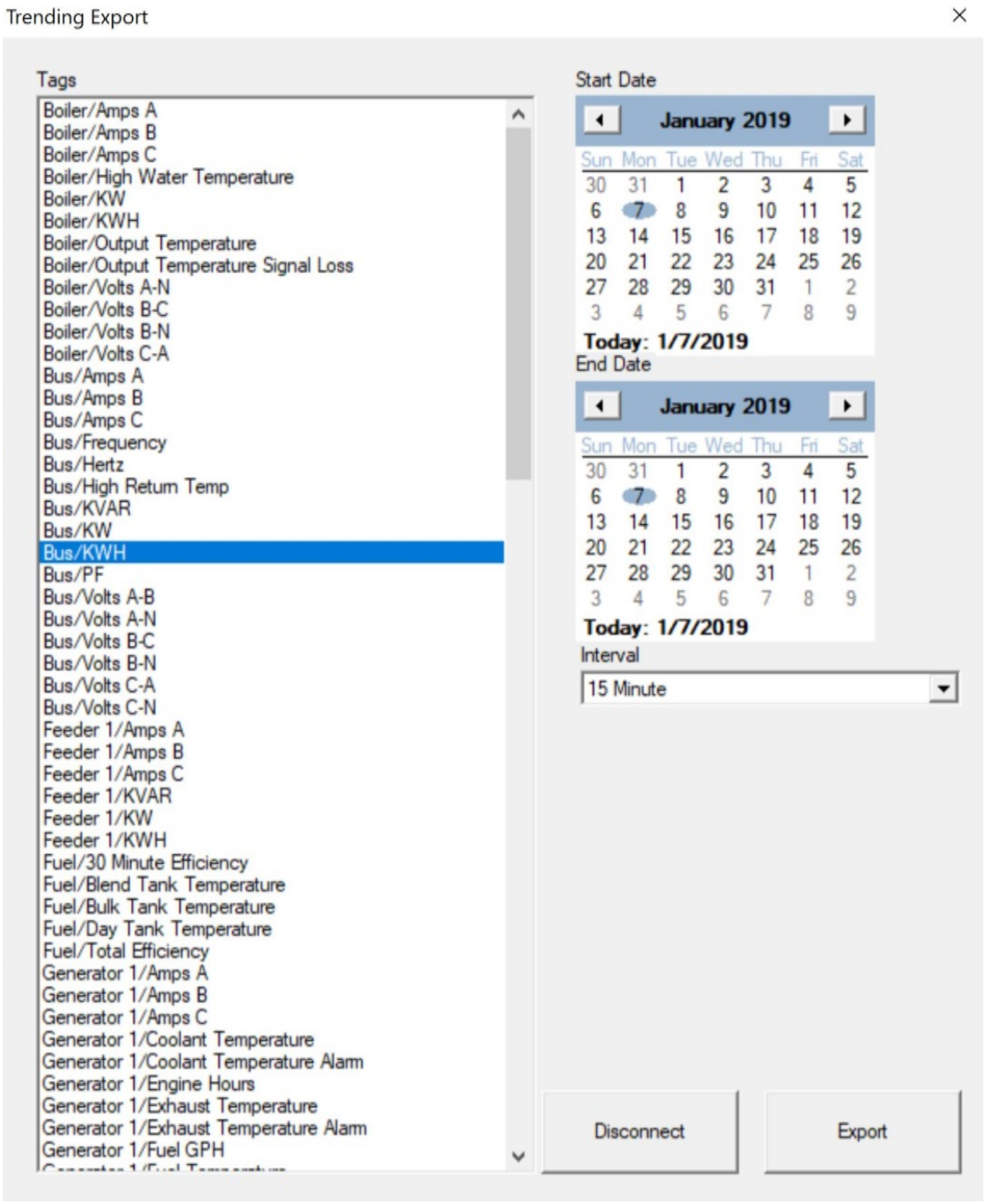
2. Shutdowns shall include all Type 2 Engine Hard Shutdowns; all Type 3 Generation Shutdowns; and the following Master Section Shutdowns: Fire Alarm, Emergency Stop, and Low Coolant Level. Shutdowns shall be red.

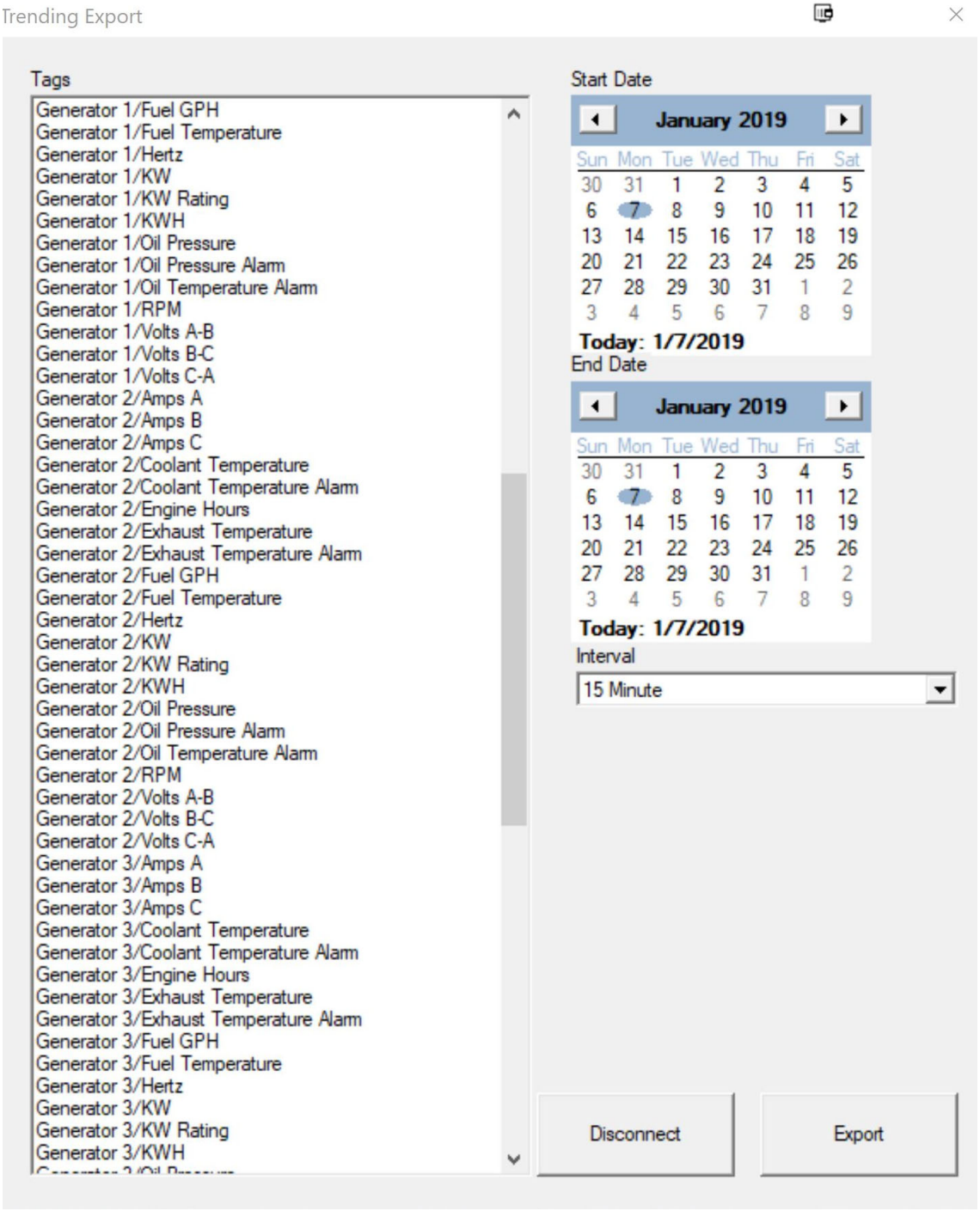


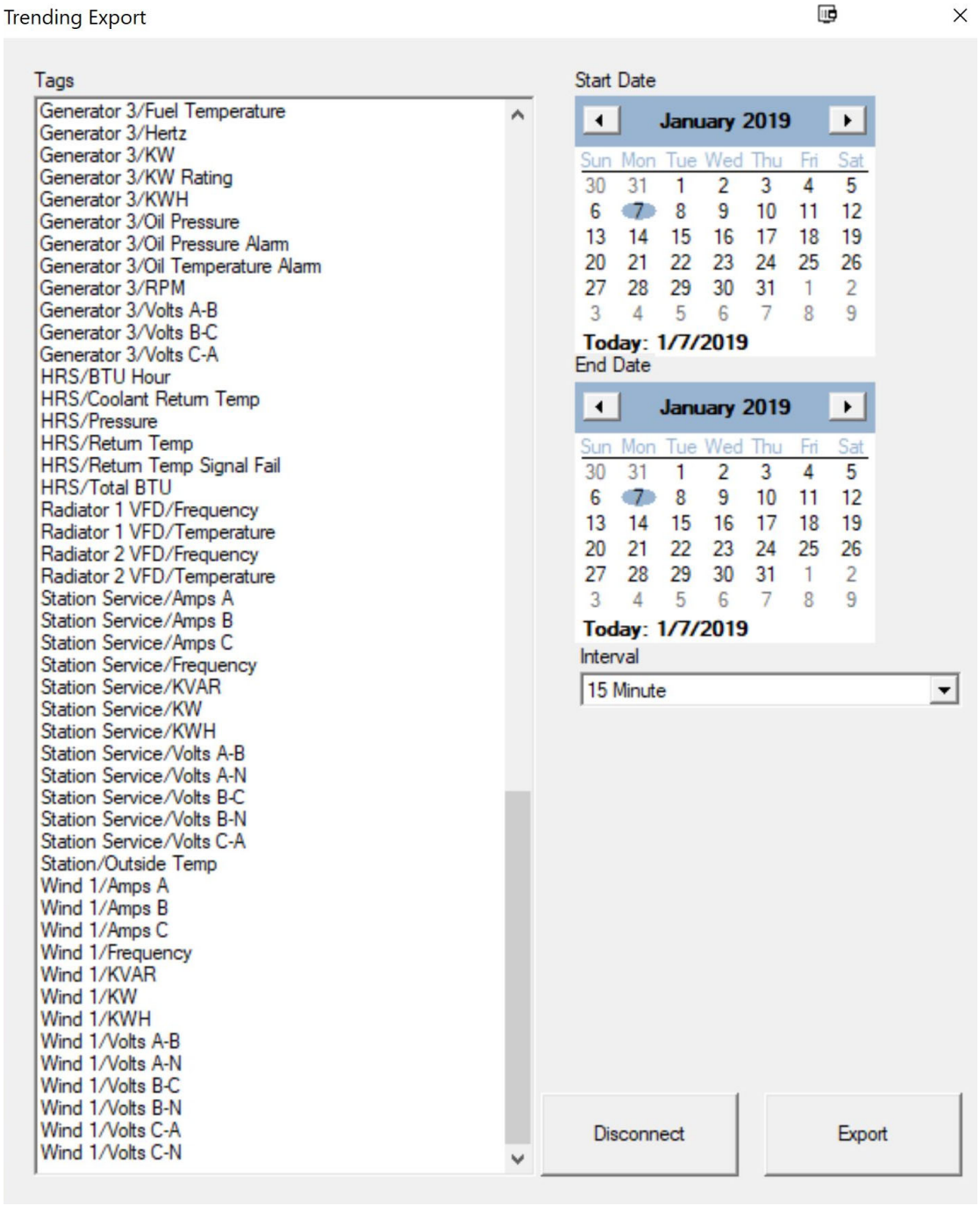
3.4 TRENDING APPLICATION TAGS

The following screens show a representative example of historical trended data and representative tag lists. Trend all PLC and SCADA data. Provide shortcut buttons as shown for ease of access to trended data. Include minimum of four (4) predefined shortcut buttons to trended data (to be determined by AEA and Utility):




Trending Export
Tags
Boiler/Amps A
Boiler/Amps B
Boiler/Amps C
Boiler/High Water Temperature
Boiler/KW
Boiler/KWH
Boiler/Output Temperature
Boiler/Output Temperature Signal Loss
Boiler/Volts A-N
Boiler/Volts B-C
Boiler/Volts B-N
Boiler/Volts C-A
Bus/Amps A
Bus/Amps B
Bus/Amps C
Bus/Frequency
Bus/Hertz
Bus/High Return Temp
Bus/KVAR
Bus/KW
Bus/KWH
Bus/PF
Bus/Volts A-B
Bus/Volts A-N
Bus/Volts B-C
Bus/Volts B-N
Bus/Volts C-A
Bus/Volts C-N
Feeder 1/Amps A
Feeder 1/Amps B
Feeder 1/Amps C
Feeder 1/KVAR
Feeder 1/KW
Feeder 1/KWH
Fuel/30 Minute Efficiency
Fuel/Blend Tank Temperature
Fuel/Bulk Tank Temperature
Fuel/Day Tank Temperature
Fuel/Total Efficiency
Generator 1/Amps A
Generator 1/Amps B
Generator 1/Amps C
Generator 1/Coolant Temperature
Generator 1/Coolant Temperature Alarm
Generator 1/Engine Hours
Generator 1/Exhaust Temperature
Generator 1/Exhaust Temperature Alarm
Generator 1/Fuel GPH
Start Date
January 2019
Sun Mon Tue Wed Thu Fri Sat
30 31 1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31 1 2
3 4 5 6 7 8 9
Today: 1/7/2019
End Date
January 2019
Sun Mon Tue Wed Thu Fri Sat
30 31 1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31 1 2
3 4 5 6 7 8 9
Today: 1/7/2019
Interval
15 Minute
Disconnect
Export


Trending Export
Tags
Generator 1/Fuel GPH
Generator 1/Fuel Temperature
Generator 1/Hertz
Generator 1/KW
Generator 1/KW Rating
Generator 1/KWH
Generator 1/Oil Pressure
Generator 1/Oil Pressure Alarm
Generator 1/Oil Temperature Alarm
Generator 1/RPM
Generator 1/Volts A-B
Generator 1/Volts B-C
Generator 1/Volts C-A
Generator 2/Amps A
Generator 2/Amps B
Generator 2/Amps C
Generator 2/Coolant Temperature
Generator 2/Coolant Temperature Alarm
Generator 2/Engine Hours
Generator 2/Exhaust Temperature
Generator 2/Exhaust Temperature Alarm
Generator 2/Fuel GPH
Generator 2/Fuel Temperature
Generator 2/Hertz
Generator 2/KW
Generator 2/KW Rating
Generator 2/KWH
Generator 2/Oil Pressure
Generator 2/Oil Pressure Alarm
Generator 2/Oil Temperature Alarm
Generator 2/RPM
Generator 2/Volts A-B
Generator 2/Volts B-C
Generator 2/Volts C-A
Generator 3/Amps A
Generator 3/Amps B
Generator 3/Amps C
Generator 3/Coolant Temperature
Generator 3/Coolant Temperature Alarm
Generator 3/Engine Hours
Generator 3/Exhaust Temperature
Generator 3/Exhaust Temperature Alarm
Generator 3/Fuel GPH
Generator 3/Fuel Temperature
Generator 3/Hertz
Generator 3/KW
Generator 3/KW Rating
Generator 3/KWH
Start Date
January 2019
Sun Mon Tue Wed Thu Fri Sat
30 31 1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31 1 2
3 4 5 6 7 8 9
Today: 1/7/2019
End Date
January 2019
Sun Mon Tue Wed Thu Fri Sat
30 31 1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31 1 2
3 4 5 6 7 8 9
Today: 1/7/2019
Interval
15 Minute
Disconnect
Export



END OF SECTION