

Project Manual For:

**Tuluksak Bulk Fuel Upgrades Project
Project No. 26078**



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

Advertising Date: April 22, 2026

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ALASKA ENERGY AUTHORITY

INVITATION TO BID

for Construction Contract

Date April 22, 2026

Tuluksak Bulk Fuel Upgrade Project No. 26078

Location of Project: Tuluksak, Alaska
Contract Officer: Selwin C. Ray
Issuing Office: Alaska Energy Authority (Authority)
State Funded [] Federal Aid [x]

Description of Work: This Federal and State appropriation funded contract is for bulk fuel storage and handling improvements, complete with gravel pad, aboveground fuel storage tanks, steel containment dikes, fuel dispensing systems, fuel piping, and all electrical work as required in 'Section 01 11 13 Work Covered by Contract Documents'. The Contractor shall furnish all labor, materials, supervision, equipment, tools, transportation, quality control, and supplies required to complete the work.

The Engineer's Estimate is between **\$7,000,000 and \$8,000,000**

All portions of the work shall be substantially completed by dates indicated in Section 01 11 13 - Summary of Work.

Bidders are invited to submit single bid, for furnishing all labor, equipment, and materials and for performing all work for the project described above.
Bids will be opened publicly on **May 21, 2026 at 2:00 PM** local time. The bid opening will be conducted telephonically. Potential bidders may attend telephonically by calling **1-469-810-0642** and when prompted enter Conference I.D. **963 044 129#**.

SUBMISSION OF BIDS

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

Bid for Project: Tuluksak Bulk Fuel Upgrade Project Project No. 26078	ATTN: Selwin C. Ray, Contract Officer Alaska Energy Authority 813 West Northern Lights Blvd. Anchorage, AK 99503
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Mailed Bids, amendments or withdrawals transmitted must be received at the above specified address no later than 4 hours prior to the scheduled time of bid opening. **Hand-delivered bids**, amendments or withdrawals must be received in the **Bid Drop Box in front of the Alaska Energy Authority**, prior to the scheduled time of bid opening. **Emailed bid** amendments or withdrawals must be received in the email inbox prior to the scheduled time of bid 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 bidders that it will affirmatively insure that in any contract entered into pursuant to this Invitation, Disadvantaged Business Enterprises (DBEs) will be afforded full opportunity to submit bids and will not be discriminated against on the grounds of race, color, national origin, or sex in consideration for an award.

NOTICE TO BIDDERS

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

See attached Supplementary Information to Bidders for this project.

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

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

Phone: (907) 771-3035

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

Dawn M. Molina, Project Manager Phone: (907) 771-3904 Email: DMMolina@akenergyauthority.org

All questions relating to bidding procedures should be directed to:

Selwin Ray
Contract Officer
813 West Northern Lights Blvd.
Anchorage, AK 99503

Phone: (907) 771-3035 (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 Bidders to have a valid Alaska Business License and an Alaska Contractor's Certificate of Registration prior to award.

ALASKA ENERGY AUTHORITY
INFORMATION TO BIDDERS

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

EXAMINATION OF CONTRACT REQUIREMENTS

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

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

CONDITIONS AT SITE OF WORK

Bidders are expected to 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 TO BIDDERS

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

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

"CONSIDERATION OF PROPOSALS

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

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

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

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

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

- (1) cancel the Contract without any damages accruing to the State; or
- (2) after notice and a hearing, assess a penalty on the Bidder in an amount that does not exceed 10 percent of the value of the Subcontract at issue.

A Bidder may replace a listed Subcontractor who:

- (1) fails to comply with AS 08.18;
- (2) files for bankruptcy or becomes insolvent;
- (3) fails to execute a contract with the Bidder involving performance of the Work for which the Subcontractor was listed and the Bidder acted in good faith;
- (4) fails to obtain bonding;
- (5) fails to obtain insurance acceptable to the State;
- (6) fails to perform the Contract with the Bidder involving Work for which the Subcontractor was listed;
- (7) must be substituted in order for the prime CONTRACTOR to satisfy required State and Federal affirmative action requirements;
- (8) refuses to agree or abide with the bidder's labor agreement; or
- (9) is determined by the Contracting Officer to be nonresponsive."

Modify subject area "AWARD OF CONTRACT" as follows:

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

Subparagraph (b) delete and substitute the following:

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

ALASKA ENERGY AUTHORITY
Special Notice to Bidders

1. A non-mandatory pre-bid meeting is scheduled for **May 1, 2026, 10:00 AM**. The pre-bid meeting will be conducted telephonically. Potential bidders may attend telephonically by calling **1-469-810-0642** and entering the conference I.D. **251 697 326#**. 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 C. 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.

2. In addition to State of Alaska funding, this project includes Federal funding which is subject to the Build America Buy America (BABA) act. The funds are being provided through the Environmental Protection Agency (EPA). Any materials not meeting domestic sourcing requirements must be documented under an approved waiver, including EPA's multi-agency Tribal Public Interest, De Minimis or Minor Components Waivers, when applicable.

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)
5. **Debarment Certification (See Federal Assurances 00 90 00)**
6. **Lobbying Certification (See Federal Assurances 00 90 00)**
7. **Build America Buy America Certification (See Federal Assurances 00 90 00)**

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)**
5. **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
of

NAME _____

ADDRESS _____

To the CONTRACTING OFFICER, ALASKA ENERGY AUTHORITY:

In compliance with your Invitation To Bid dated **April 22, 2026**, 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

Tuluksak Bulk Fuel Upgrade Project

Project No. 26078

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

The Undersigned declares that he has carefully examined the contract requirements 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

Tuluksak Bulk Fuel Upgrades Project Project No. 26078

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
	BASE BID SCHEDULE A: CO-LOCATED BULK FUEL TANK FARM	
A1	Mobilization / Demobilization	\$
A2	Civil Site Work	\$
A3	Co-Located Bulk Fuel Tank Farm	\$
A4	Electrical Systems	\$
A5	Spill Response Equipment	\$
A6	Filter / Transfer Fuel & Decommission Existing Tank Farms	\$
A7	Manifesting, Transport and Disposal of RCRA Hazardous Waste	\$
A8	Transport and Disposal of State Regulated Non-Hazardous Waste	\$
	BASE BID SCHEDULE B: SCHOOL BULK FUEL TANK FARM	
B1	School - Mobilization / Demobilization	\$
B2	School – Civil Site Work	\$

B3	School – Bulk Fuel Tank Farm	\$
B4	School – Electrical Systems	\$
B5	School – Spill Response Equipment	\$
B6	School - Filter / Transfer Fuel & Decommission Existing Tank Farms	\$
B7	School - Manifesting, Transport and Disposal of RCRA Hazardous Waste	\$
B8	School - Transport and Disposal of State Regulated Non-Hazardous Waste	\$
Total Base Bid		\$

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

BID BOND

For
Tuluksak Bulk Fuel Upgrades Project
Project No. 26078

DATE BOND EXECUTED: _____

PRINCIPAL (Legal name and business address):

TYPE OF ORGANIZATION:

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

SURETY(IES) (Name and business address):

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

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

THE CONDITION OF THE FOREGOING OBLIGATION is that the Principal has submitted the accompanying bid in writing, date as shown above, on 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.

SUBCONTRACTOR LIST

**Tuluksak Bulk Fuel Upgrades Project
Project No. 26078**

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

CONSTRUCTION CONTRACT
Tuluksak Bulk Fuel Upgrades Project
Project No. 26078

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(s) indicated in Section 01 11 13 - Summary of Work**
Final Completion: **Date(s) indicated in Section 01 11 13 - Summary of Work**

It is expressly understood and agreed that in case of the failure on the part of the Contractor, for any reason, except with the written consent of the Authority, to complete the furnishing and delivery of materials and the doing and performance of the work before the aforesaid date, the Authority shall have the right to deduct from any money due or which may become due the Contractor, or if no money shall be due, the Authority shall have the right to recover **Five Hundred Dollars (\$500.00)** per day for each calendar day elapsing between the time stipulated for the completion and the actual date of completion up to a maximum of **\$10,000 (20 days)** in accordance with the terms hereof; such deduction to be made, or sum to be recovered, not as a penalty but as liquidated damages.

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

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

CONTRACTOR

Company Name

Signature of Authorized Company Representative

Typed Name and Title

Date

(Corporate Seal)

ALASKA ENERGY AUTHORITY

Signature of Contracting Officer

Typed Name

Date

ALASKA ENERGY AUTHORITY

PERFORMANCE BOND

Bond No. _____

For
Tuluksak Bulk Fuel Upgrades Project
Project No. 26078

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. _____

**Tuluksak Bulk Fuel Upgrades Project
Project No. 26078**

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.

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

6.14	Use of Premises
6.15	Structural Loading
6.16	Record Documents
6.17	Safety and Protection
6.18	Safety Representative
6.19	Emergencies
6.20	Shop Drawings and Samples
6.21	Shop Drawing and Sample Review
6.22	Maintenance during Construction
6.23	Continuing the Work
6.24	Consent to Assignment
6.25	Use of Explosives
6.26	CONTRACTOR's Records
6.27	Load Restrictions
ARTICLE 7 LAWS AND REGULATIONS	
7.1	Laws to be observed
7.2	Permits, Licenses, and Taxes
7.3	Patented Devices, Materials and Processes
7.4	Compliance of Specifications and Drawings
7.5	Accident Prevention
7.6	Sanitary Provisions
7.7	Business Registration
7.8	Professional Registration and Certification
7.9	Local Building Codes
7.10	Air Quality Control
7.11	Archaeological or Paleontological Discoveries
7.12	Applicable Alaska Preferences
7.13	Preferential Employment
7.14	Wages and Hours of Labor
7.15	Overtime Work Hours and Compensation
7.16	Covenants against Contingent Fees
7.17	Officials Not to Benefit
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ARTICLE 8 OTHER WORK	
8.1	Related Work at Site
8.2	Access, Cutting, and Patching
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ARTICLE 9 CHANGES	
9.1	AUTHORITY's Right to Change
9.2	Authorization of Changes within the General Scope
9.3	Directive
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9.5	Shop Drawing Variations
9.6	Changes outside the General Scope; Supplemental Agreement
9.7	Unauthorized Work
9.8	Notification of Surety
9.9	Differing Site Conditions

9.10 Interim Work Authorization

ARTICLE 10 CONTRACT PRICE; COMPUTATION AND CHANGE

- 10.1 Contract Price
- 10.2 Claims for Price Change
- 10.3 Change Order Price Determination
- 10.4 Cost of the Work
- 10.5 Excluded Costs
- 10.6 CONTRACTOR's Fee
- 10.7 Cost Breakdown
- 10.8 Cash Allowances
- 10.9 Unit Price Work
- 10.10 Determinations for Unit Prices

ARTICLE 11 CONTRACT TIME, COMPUTATION AND CHANGE

- 11.1 Commencement of Contract Time; Notice to Proceed
- 11.2 Starting the Work
- 11.3 Computation of Contract Time
- 11.4 Time Change
- 11.5 Extension Due to Delays
- 11.6 Essence of Contract
- 11.7 Reasonable Completion Time
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ARTICLE 12 QUALITY ASSURANCE

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

ARTICLE 13 PAYMENTS TO CONTRACTOR AND COMPLETION

- 13.1 Schedule of Values
- 13.2 Preliminary Payments
- 13.3 Application for Progress Payment
- 13.4 Review of Applications for Progress Payments
- 13.5 Stored Materials and Equipment
- 13.6 CONTRACTOR's Warranty of Title
- 13.7 Withholding of Payments
- 13.8 Retainage
- 13.9 Request for Release of funds
- 13.10 Substantial Completion
- 13.11 Access Following Substantial Completion
- 13.12 Final Inspection
- 13.13 Final Completion and Application for Payment
- 13.14 Final Payment

- 13.15 Final Acceptance
- 13.16 CONTRACTOR's Continuing Obligation
- 13.17 Waiver of Claims by CONTRACTOR
- 13.18 No Waiver of Legal Rights

ARTICLE 14 SUSPENSION OF WORK AND TERMINATION

- 14.1 AUTHORITY May Suspend Work
- 14.2 Default of Contract
- 14.3 Rights or Remedies
- 14.4 Convenience Termination

ARTICLE 15 CLAIMS AND DISPUTES

- 15.1 Notification
- 15.2 Presenting Claim
- 15.3 Claim Validity, Additional Information & Authority's Action
- 15.4 Contracting Officer's Decision
- 15.5 Appeals on a Contract Claim
- 15.6 Construction Contract Claim Appeal
- 15.7 Fraud and Misrepresentation in Making a Claim

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 1 of the Specifications which contain administrative and procedural requirements as well as requirements for temporary facilities which apply to Specification Divisions 2 through 16.

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

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

If any Holiday listed above falls on a Saturday, Saturday and the preceding Friday are both legal Holidays. If the Holiday should fall on a Sunday, except (12) above, Sunday and the following Monday are both legal Holidays. See Title 44, Alaska Statutes.

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

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

4.1 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 6.17. The CONTRACTOR may be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are directly attributable to the existence of any underground utility that was not shown or indicated in the Contract Documents and which the CONTRACTOR could not reasonably have been expected to be aware of.

4.7 Survey Control:

The 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 CONTRACTOR 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

6.1 Supervision of Work:

The CONTRACTOR shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. All Work under this Contract shall be performed in a skillful and workmanlike manner. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction.

6.2 Superintendence by CONTRACTOR:

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

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

6.3 Character of Workers:

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

6.4 CONTRACTOR to Furnish:

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

6.5 Materials and Equipment:

All materials and equipment shall be of specified quality and new, except as otherwise provided in the Contract Documents. If required by the Project Manager, the CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be

effective to assign to the AUTHORITY or any of the AUTHORITY's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 2.3.

6.6 Anticipated Schedules:

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

Anticipated schedule of Shop Drawing submissions; and

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

6.7 Finalizing Schedules:

Prior to processing the first Application for Payment the Project Manager and the CONTRACTOR will finalize schedules required by paragraph 6.6. The finalized progress schedule will be acceptable to the AUTHORITY as providing information related to the orderly progression of the Work to completion within the Contract Time; but such acceptance will neither impose on the AUTHORITY nor relieve the CONTRACTOR from full responsibility for the progress or scheduling of the Work. If accepted, the finalized schedule of Shop Drawing and other required submissions will be acknowledgment by the AUTHORITY as providing a workable arrangement for processing the submissions. If accepted, the finalized Schedule of Values will be acknowledgment by the AUTHORITY as an approximation of anticipated value of Work accomplished over the anticipated Contract Time. Receipt and acceptance of a schedule submitted by the CONTRACTOR shall not be construed to assign responsibility for performance or contingencies to the AUTHORITY or relieve the CONTRACTOR of his responsibility to adjust his forces, equipment, and work schedules as may be necessary to insure completion of the Work within prescribed Contract Time. Should the prosecution of the Work be discontinued for any reason, the CONTRACTOR shall notify the Project Manager at least 24 hours in advance of resuming operations.

6.8 Adjusting Schedules:

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

6.9 Substitutes or "Or-Equal" Items:

- 6.9.1 Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by

words indicating that substitution is limited or not permitted, materials or equipment of other Suppliers may be accepted by the Project Manager only if sufficient information is submitted by the CONTRACTOR which clearly demonstrates to the Project Manager that the material or equipment proposed is equivalent or equal in all aspects to that named. The procedure for review by the Project Manager will include the following as supplemented in the General Requirements.

- 6.9.2 Requests for review of substitute items of material and equipment will not be accepted by the Project Manager from anyone other than the CONTRACTOR.
- 6.9.3 If the CONTRACTOR wishes to furnish or use a substitute item of material or equipment, the CONTRACTOR shall make written application to the Project Manager for Approval thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as the specified. The application will state that the evaluation and Approval of the proposed substitute will not delay the CONTRACTOR's timely achievement of Substantial or Final Completion, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with the AUTHORITY for Work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty.
- 6.9.4 All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by the AUTHORITY in evaluating the proposed substitute. The AUTHORITY may require the CONTRACTOR to furnish at the CONTRACTOR's expense additional data about the proposed substitute. The Project Manager may reject any substitution request which the Project Manager determines is not in the best interest of the OWNER.
- 6.9.5 Substitutions shall be permitted during or after the bid period as allowed and in accordance with Document 00 02 00 - Invitation for Bids, Document 00 70 00 – General Conditions, and Document 01 60 00 – Materials and Equipment.

6.10 Substitute Means and Methods:

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

6.11 Evaluation of Substitution:

The Project Manager will be allowed a reasonable time within which to evaluate each proposed substitute. The Project Manager will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without the Contracting Officer's prior written Approval which will be evidenced by either a Change Order or a Shop Drawing Approved in accordance with Sections 6.20 and 6.21. The Contracting Officer may require the CONTRACTOR to furnish at the

CONTRACTOR's expense a special performance guarantee or other Surety with respect to any substitute.

6.12 Dividing the Work:

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

6.13 Subcontractors:

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

- 6.13.1 The CONTRACTOR shall not award any Work to any Subcontractor without prior written Approval of the Contracting Officer. This Approval will not be given until the CONTRACTOR submits to the Contracting Officer a written statement concerning the proposed award to the Subcontractor which shall contain required Equal Employment Opportunity documents, evidence of insurance whose limits are acceptable to the CONTRACTOR, and an executed copy of the subcontract. All subcontracts shall contain provisions for prompt payment, release of retainage, and interest on late payment amounts and retainage as specified in AS 36.90.210. Contracts between subcontractors, regardless of tier, must also contain these provisions.
- 6.13.2 The CONTRACTOR shall be fully responsible to the AUTHORITY for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions.
- 6.13.3 All Work performed for CONTRACTOR by a Subcontractor will be pursuant to an appropriate written agreement between CONTRACTOR and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the AUTHORITY and contains waiver provisions as required by paragraph 13.17 and termination provisions as required by Article 14.
- 6.13.4 Nothing in the Contract Documents shall create any contractual relationship between the AUTHORITY and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of the AUTHORITY to pay or to see to the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Regulatory Requirements. The AUTHORITY will not undertake to settle any differences between or among the CONTRACTOR, Subcontractors, or Suppliers.
- 6.13.5 The CONTRACTOR and Subcontractors shall coordinate their work and cooperate with other trades so to facilitate general progress of Work. Each trade shall afford other trades every reasonable opportunity for installation of their work and storage of materials. If cooperative work of one trade must be altered due to lack of proper supervision or failure to make proper provisions in time by another trade, such conditions shall be remedied by the CONTRACTOR with no change in Contract Price or Contract Time.

6.13.6 The CONTRACTOR shall include on his own payrolls any person or persons working on this Contract who are not covered by written subcontract, and shall ensure that all Subcontractors include on their payrolls all persons performing Work under the direction of the Subcontractor.

6.14 Use of Premises:

The CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Project limits and approved remote storage sites and lands and areas identified in and permitted by Regulatory Requirements, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. The CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the Work. Should any claim be made against the AUTHORITY by any such owner or occupant because of the performance of the Work, the CONTRACTOR shall hold the AUTHORITY harmless.

6.15 Structural Loading:

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

6.16 Record Documents:

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

6.17 Safety and Protection:

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

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

The CONTRACTOR shall comply with all applicable Regulatory Requirements of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. The

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

6.18 Safety Representative:

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

6.19 Emergencies:

In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the AUTHORITY, is obligated to act to prevent threatened damage, injury or loss. The CONTRACTOR shall give the Project Manager prompt written notice if the CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If the AUTHORITY determines that a change in the Contract Documents is required because of the action taken in response to an emergency, a change will be authorized by one of the methods indicated in Paragraph 9.2, as determined appropriate by the Project Manager.

6.20 Shop Drawings and Samples:

- 6.20.1 After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, the CONTRACTOR shall submit to the Project Manager for review and Approval in accordance with the accepted schedule of Shop Drawing submissions the required number of all Shop Drawings, which will bear a stamp or specific written indication that the CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission. All submissions will be identified as the Project Manager may require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable the Project Manager to review the information as required.
- 6.20.2 The CONTRACTOR shall also submit to the Project Manager for review and Approval with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and accompanied by a specific written indication that the CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission and will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended.
- 6.20.3 Before submission of each Shop Drawing or sample the CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation

requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents.

6.20.4 At the time of each submission the CONTRACTOR shall give the Project Manager specific written notice of each variation that the Shop Drawings or samples may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on each Shop Drawing submitted to the Project Manager for review and Approval of each such variation. All variations of the proposed Shop Drawing from that specified will be identified in the submission and available maintenance, repair and replacement service will be indicated. The submittal will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such variation, including costs of redesign and claims of other Contractors affected by the resulting change, all of which shall be considered by the AUTHORITY in evaluating the proposed variation. If the variation may result in a change of Contract Time or Price, or Contract responsibility, and is not minor in nature; the CONTRACTOR must submit a written request for Change Order with the variation to notify the AUTHORITY of his intent. The AUTHORITY may require the CONTRACTOR to furnish at the CONTRACTOR's expense additional data about the proposed variation. The Project Manager may reject any variation request which the Project Manager determines is not in the best interest of the AUTHORITY.

6.21 Shop Drawing and Sample Review:

- 6.21.1 The Project Manager will review with reasonable promptness Shop Drawings and samples, but the Project Manager's review will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review of a separate item as such will not indicate acceptance of the assembly in which the item functions. The CONTRACTOR shall make corrections required by the Project Manager and shall return the required number of corrected copies of Shop Drawings and submit as required new samples for review. The CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by the Project Manager on previous submittals.
- 6.21.2 The Project Manager's review of Shop Drawings or samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless the CONTRACTOR has in writing advised the Project Manager of each such variation at the time of submission as required by paragraph 6.20.4. The Contracting Officer if he so determines, may give written Approval of each such variation by Change Order, except that, if the variation is minor and no Change Order has been requested a specific written notation thereof incorporated in or accompanying the Shop Drawing or sample review comments shall suffice as a modification. Approval by the Contracting Officer will not relieve the CONTRACTOR from responsibility for errors or omissions in the Shop Drawings or from responsibility for having complied with the provisions of paragraph 6.20.3.
- 6.21.3 The AUTHORITY shall be responsible for all AUTHORITY review costs resulting from the initial submission and the resubmittal. The CONTRACTOR shall, at the discretion of the AUTHORITY, pay all review costs incurred by the AUTHORITY as a result of any additional re-submittals.

6.21.4 Where a Shop Drawing or sample is required by the Specifications, any related Work performed prior to the Project Manager's review and Approval of the pertinent submission will be the sole expense and responsibility of the CONTRACTOR.

6.22 Maintenance During Construction:

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

6.23 Continuing the Work:

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

6.24 Consent to Assignment:

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

6.25 Use of Explosives:

6.25.1 When the use of explosives is necessary for the prosecution of the Work, the CONTRACTOR shall exercise the utmost care not to endanger life or property, including new Work and shall follow all Regulatory Requirements applicable to the use of explosives. The CONTRACTOR shall be responsible for all damage resulting from the use of explosives.

6.25.2 All explosives shall be stored in a secure manner in compliance with all Regulatory Requirements, and all such storage places shall be clearly marked. Where no Regulatory Requirements apply, safe storage shall be provided not closer than 1,000 feet from any building, camping area, or place of human occupancy.

6.25.3 The CONTRACTOR shall notify each public utility owner having structures in proximity to the site of his intention to use explosives. Such notice shall be given sufficiently in advance to enable utility owners to take such steps as they may deem necessary to protect their property from injury. However, the CONTRACTOR shall be responsible for all damage resulting from the use of the explosives, whether or not, utility owners act to protect their property.

6.26 CONTRACTOR's Records:

6.26.1 Records of the CONTRACTOR and Subcontractors relating to personnel, payrolls, invoices of materials, and any and all other data relevant to the performance of this Contract, must be kept on a generally recognized accounting system. Such records must be available during normal work hours to the Contracting Officer for purposes of investigation to ascertain compliance with Regulatory Requirements and provisions of the Contract Documents.

- 6.26.2 Payroll records must contain the name and address of each employee, his correct classification, rate of pay, daily and weekly number of hours of work, deductions made, and actual wages paid. The CONTRACTOR and Subcontractors shall make employment records available for inspection by the Contracting Officer and representatives of the U.S. and/or State Department of Labor and will permit such representatives to interview employees during working hours on the Project.
- 6.26.3 Records of all communications between the 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 18.60.075 and all pertinent provisions of the Construction Code Occupational Safety and Health Standards issued by the Alaska Department of Labor.

7.6 Sanitary Provisions:

The CONTRACTOR shall provide and maintain in a neat and sanitary condition such accommodations for the use of his employees and 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 35.10.025 which requires construction in accordance with applicable local building codes to include the obtaining of required permits.

7.10 Air Quality Control:

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

7.11 Archaeological or Paleontological Discoveries:

When the CONTRACTOR's operation encounters prehistoric artifacts, burials, remains of dwelling sites, or paleontological remains, such as shell heaps, land or sea mammal bones or tusks, the CONTRACTOR shall cease operations immediately and notify the 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.

7.15 Overtime Work Hours and Compensation:

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

7.16 Covenant Against Contingent Fees:

The CONTRACTOR warrants that no person or selling agent has been employed or retained to solicit or secure this Contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the CONTRACTOR for the purpose of securing business. For breach or violation of this warrant, the 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

8.1 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 10 - CONTRACT PRICE; COMPUTATION AND CHANGE

10.1 Contract Price:

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

10.2 Claim for Price Change:

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

10.3 Change Order Price Determination:

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

10.3.1 Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved (subject to the provisions of subparagraphs 10.9.1 through 10.9.3, inclusive).

10.3.2 By mutual acceptance of a lump sum price 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.

10.4 Cost of the Work:

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

- 10.4.1 Payroll costs for employees in the direct employ of the CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by the 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 10.4.1 or specifically covered by paragraph 10.4.4 all of which are to be considered administrative costs covered by the CONTRACTOR's fee.
- 10.5.2 Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.

- 10.5.3 Any part of CONTRACTOR's capital expenses including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.
- 10.5.4 Cost of premiums for all bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph 10.4.5.i above).
- 10.5.5 Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of Defective Work, disposal of materials or equipment wrongly supplied and making good any damage to property.
- 10.5.6 Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 10.4.

10.6 CONTRACTOR's Fee:

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

- 10.6.1 A mutually acceptable fixed fee; or if none can be agreed upon.
- 10.6.2 A fee based on the following percentages of the various portions of the "cost of the work":
 - a. For costs incurred under paragraphs 10.4.1 and 10.4.2, the CONTRACTOR's fee shall be twenty percent;
 - b. For costs incurred under paragraph 10.4.3, the CONTRACTOR's fee shall be ten percent; and if a subcontract is on the basis of "cost of the work" plus a fee, the maximum allowable to CONTRACTOR on account of overhead and profit of all Subcontractors and multiple tiers thereof shall be fifteen percent;
 - c. No fee shall be payable on the basis of costs itemized under paragraphs 10.4.4, 10.4.5 and 10.5;
 - d. The amount of credit to be allowed by the CONTRACTOR to the 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 in 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 12 - 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:

- 12.3.1 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 12.9.
- 13.7.4 The AUTHORITY's actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.2.1.a through 14.2.1.k inclusive.
- 13.7.5 Claims have been made against the 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 13.7.1 through 13.7.5.
- 13.7.7 The CONTRACTOR has failed to fulfill or is in violation of any of his obligations under any provision of this Contract.

13.8 Retainage:

At any time the 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 10% 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 5.1, the written consent of the Surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the CONTRACTOR to the 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.

13.16 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.

13.17 Waiver of Claims by CONTRACTOR:

The making and acceptance of final payment will constitute a waiver of all claims by the CONTRACTOR against the 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 14 - SUSPENSION OF WORK, DEFAULT AND TERMINATION

14.1 AUTHORITY 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 procurement costs. Following termination the CONTRACTOR shall not be entitled to receive any further balance of the amount to be paid under the Contract until the Work is fully finished and accepted, at which time if the unpaid balance exceeds the amount due the 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 15 - CLAIMS AND DISPUTES

15.1 Notification

- 15.1.1 The CONTRACTOR shall notify the AUTHORITY in writing as soon as the CONTRACTOR becomes aware of any act or occurrence which may form the basis of a claim for additional compensation or an extension of Contract Time or of any dispute regarding a question of fact or interpretation of the Contract. The AUTHORITY has no obligation to investigate any fact or occurrence that might form the basis of a claim or to provide any additional compensation or extension of Contract Time unless the CONTRACTOR has notified the AUTHORITY in writing in a timely manner of all facts the CONTRACTOR believes form the basis for the claim.
- 15.1.2 If the CONTRACTOR believes that he is entitled to an extension of Contract Time, then the CONTRACTOR must state the contract section on which he basis his extension request, provide the AUTHORITY with sufficient information to demonstrate that the CONTRACTOR has suffered excusable delay, and show the specific amount of time to which the CONTRACTOR is entitled. The AUTHORITY will not grant an extension of Contract Time if the CONTRACTOR does not timely submit revised schedules under **Section 01 32 00**.
- 15.1.3 If the matter is not resolved by agreement within 7 days, the CONTRACTOR shall submit an Intent to Claim, in writing, to the AUTHORITY within the next 14 days.
- 15.1.4 If the CONTRACTOR believes additional compensation or time is warranted, then he must immediately begin keeping complete, accurate, and specific daily records concerning every detail of the potential claim including actual costs incurred. The

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

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

15.2 Presenting the Claim

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

15.3 Claim Validity, Additional Information, and AUTHORITY's Action

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

15.4 Contracting Officer's Decision

- 15.4.1 The CONTRACTOR will be furnished the Contracting Officer's Decision within 90 days, unless the Contracting Officer requests additional information or gives the CONTRACTOR notice that the time for issuing a decision is being extended for a specified period. The Contracting Officer's decision is final and conclusive unless,

within 14 days of receipt of the decision, the CONTRACTOR delivers a Notice of Appeal to the Executive Director of the Authority.

15.5 Appeals on a Contract Claim.

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

- a. An appeal must contain a copy of the decision being appealed and identification of the factual or legal errors in the decision that form the basis for the appeal.
- b. The Executive Director shall handle the appeal of a claim under this section expeditiously.

15.6 Construction Contract Claim Appeals.

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

- a. binding and final arbitration under AS 09.43.010 - 09.43.180 (Uniform Arbitration Act) if the claim is:
 1. less than \$250,000 and the CONTRACTOR requests arbitration of the claim; or
 2. \$250,000 or more and both the agency and the CONTRACTOR agree to arbitration of the claim; or
- b. a hearing under the Authority's established policy and procedures if the claim is not handled by arbitration under 15.6.1 of this subsection.

15.7 Fraud and Misrepresentation in Making Claims

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

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SECTION 00 80 00 SUPPLEMENTARY CONDITIONS

MODIFICATIONS TO THE GENERAL CONDITIONS 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-4.3-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. See Section 01 71 23.16 - Construction Surveying for project specific surveying requirements.

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 Alaska Energy Authority
The State of Alaska
The Denali Commission
ANTHC (including waiver of subrogation)
Tulkisarmute, Inc.

SC-5.4.2d- BUILDER'S RISK INSURANCE

At General Conditions Article 5.4.2.e the following additional insurance is added:

Inland Marine Cargo Insurance: Contractor shall provide Inland Marine Cargo Insurance for the full value of all Owner Furnished materials in transport. Minimum coverage amount shall be \$1,500,000.

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 of Work) shall not apply to work in Tuluksak. This is because Tulkisarmute, Inc. is not a political subdivision of the State of Alaska and therefore this work is not subject to AS 36.05 (Public Construction Contracts Requirements).

General Condition Article 7.14.2 (Alaska Little-Davis-Bacon Wage Rates) shall not apply to work in Tuluksak. This is because Tulkisarmute, Inc. is not a political subdivision of the State of Alaska and therefore this work is not subject to AS 36.05. However, all work on site in Tulukask is subject to Federal Davis Bacon wage rates because EPA funds are subject to DBRA requirements; therefore, the Contractor is required to prepare and submit weekly certified payroll to the Authority, refer to SC-90.4.. See Section 00 90 00, Federal Assurances, 90.4.

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-10.6.2 – CONTRACTOR'S FEE

At General Conditions Article 10.6.2 delete in its entirety and replace with the following:

"The following maximum rates of cost markup (to cover both overhead and profit of the CONTRACTOR) shall be used in the negotiation of a Cost of Work 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)."

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, add the following paragraphs:

11.8.1 For each calendar day that the Work is not Substantially Complete after the Substantial Completion date has passed, the AUTHORITY shall deduct \$500 from progress payments up to a maximum of \$10,000 (20 days).

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

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

SC-12.1–WARRANTY AND GUARANTEE

At General Condition Article 12.1, add the following sentence:

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

SC-12.6–CORRECTION OR REMOVAL OF DEFECTIVE WORK

At General Condition Article 12.6, add the following paragraph:

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

SC – 13.5 – 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.”

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

Federal Assurances Paragraph 90.4 Federal Davis Bacon Wage requirements. EPA funds are subject to Federal Davis Bacon wage requirements, therefore: ADD to paragraph 90.4 the following: The Contractor shall post in a prominent place at the Job Site the applicable wage determination(s) and Department of Labor Publication: WH-1321, Notice to Employees Working on Federally Assisted Construction Projects.

SC-90.13–DOMESTIC PREFERENCES FOR PROCUREMENTS

The federal funding for this project are subject to the Build America, Buy America Act and therefore this purchase must comply with Buy America Preferences for Infrastructure Projects, 2 CFR 184. See Section 00 90 10 Buy America Preferences.

The EPA Buy America Compliance requirements, including applicable waivers, are specified under Section 00 90 12.

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](#).

The federal funding for this project is subject to the Build America, Buy America Act and therefore this purchase must comply with Buy America Preferences for Infrastructure Projects, [2 CFR 184](#). See Section 00 90 10 Buy America Preferences. Note the following:

- The bid must include the Build America, Buy America Certificate at the end of this section.
- The EPA Buy America Compliance requirements, including applicable waivers, are specified under Section 00 90 12.

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: _____

BUILD AMERICA, BUY AMERICA ACT PREFERENCES FOR INFRASTRUCTURE PROJECTS – 2 CFR 184; Executive Order 14005 [Applicable to federally assisted infrastructure contracts which exceed \$250,000]

The Contractor acknowledges that it understands the goods and services under this Agreement are funded with federal monies subject to statutory requirements known as “Build America, Buy America” that requires all of the iron and steel, manufactured products, and construction materials used in the Project to be produced in the United States (“Build America, Buy America requirements”).

The Contractor hereby represents and warrants to the Authority and the Federal Awarding Agency:

(a) the contractor has reviewed and understands the Build America, Buy America requirements,

(b) all of the iron and steel, manufactured products, and construction materials used in the Project will be produced in the United States in a manner that complies with the Build America, Buy America requirements, unless a waiver of the requirements is approved, and

(c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the Build America, Buy America requirements, as may be requested by the Authority or the Federal Awarding Agency.

Notwithstanding any other provision of this Agreement, any failure to comply with these requirements by the Contractor shall permit the Authority to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Authority resulting from any such failure or any damages owed to the Federal Awarding Agency by the Authority. Neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without prior written consent of the Authority.

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 §184 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

**ALASKA ENERGY AUTHORITY
SECTION 00 90 10
BUILD AMERICA, BUY AMERICA ACT
PREFERENCES FOR INFRASTRUCTURE PROJECTS**

Build America, Buy America (BABAA) requirements are promulgated under 2 CFR 184. The Build America, Buy America Act Preference requirements described herein are paraphrased from 2 CFR 184. Following is a link to 2 CFR 184:

<https://www.ecfr.gov/current/title-2/subtitle-A/chapter-I/part-184>

The Office of Management and Budget issued Memo M-24-02, which provides additional guidance on the application of Preference requirements:

<https://www.whitehouse.gov/M-24-02-Buy-America-Implementation-Guidance-Update>

184.1 Build America, Buy America Act Requirement

All iron, steel, manufactured products, and construction materials incorporated into the Project shall be produced in the United States, as set forth in part I of subtitle A, Buy America Sourcing Preferences, of the Build America, Buy America Act (BABAA) included in the Infrastructure Investment and Jobs Act (Pub. L. 117-58) at division G, title IX, subtitle A, part I, sections 70911 through 70917.

184.2 Not Used

184.3 Definitions

Component means an article, material, or supply, whether manufactured or unmanufactured, that is incorporated directly into a manufactured product or an iron or steel product.

Construction materials means articles, materials, or supplies that consist of only one of the below listed items. To the extent one of the below listed items contains other listed items in this paragraph, it is nonetheless a construction material.

- A. The listed items are:
1. Non-ferrous metals;
 2. Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
 3. Glass (including optic glass);
 4. Fiber optic cable (including drop cable);
 5. Optical fiber;
 6. Lumber;
 7. Engineered wood;
 8. and Drywall.

Iron or steel products means articles, materials, or supplies that consist wholly or predominantly of iron or steel or a combination of both.

Manufactured products means:

- A. Articles, materials, or supplies that have been:
 - 1. Processed into a specific form and shape; or
 - 2. Combined with other articles, materials, or supplies to create a product with different properties than the individual articles, materials, or supplies.
- B. If an item is classified as an iron or steel product, a construction material, or a section 70917(c) material under 184.4 and the definitions set forth in this section, then it is not a manufactured product. However, an article, material, or supply classified as a manufactured product under 184.4 and paragraph (1) of this definition may include components that are construction materials, iron or steel products, or section 70917(c) materials

Section 70917 (c) materials means cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives.

Manufacturer means the entity that performs the final manufacturing process that produces a manufactured product.

Predominantly of iron or steel or a combination of both means that the cost of the iron and steel content exceeds 50 percent of the total cost of all its components. The cost of iron and steel is the cost of the iron or steel mill products (such as bar, billet, slab, wire, plate, or sheet), castings, or forgings utilized in the manufacture of the product *and a good faith estimate of the cost of iron or steel components*

Produced in the United States means:

- A. In the case of iron or steel products, all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.
- B. In the case of manufactured products:
 - 1. The product was manufactured in the United States; and
 - 2. The cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product. The costs of components of a manufactured product are determined in accordance with 184.5.
- C. In the case of construction materials, all manufacturing processes for the construction material occurred in the United States. *See 184.6 for more information on the meaning of “all manufacturing processes” for specific construction materials.*

184.4 Applying the Build America, Buy America Act Preference.

Categorization of articles, materials, and supplies.

An article, material, or supply incorporated into an infrastructure project shall meet the Buy America Preference for the category in which it is classified. The classification of an article, material, or supply

into one of the below categories *shall be made based on its status at the time it is brought to the work site for incorporation into an infrastructure project.*

- A. An article, material, or supply shall be classified into one of the following categories:
 - 1. Iron or steel products;
 - 2. Manufactured products;
 - 3. Construction materials; or
 - 4. Section 70917(c) materials.

184.5 Determining the cost of components for manufactured products.

In determining whether the cost of components for manufactured products is greater than 55 percent of the total cost of all components, the following applies:

- A. **For components purchased by the manufacturer**, the acquisition cost, including transportation costs to the place of incorporation into the manufactured product (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or
- B. **For components manufactured by the manufacturer**, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (a) of this section, plus allocable overhead costs, *but excluding profit. Cost of components does not include any costs associated with the manufacture of the manufactured product.*

184.6 Construction materials

- A. The Build America, Buy America Act Preference applies to the following construction materials incorporated into infrastructure projects. Each construction material is followed by a standard for the material to be considered “produced in the United States.” Except as specifically provided, only a single standard under this section should be applied to a single construction material.
 - 1. Non-ferrous metals. All manufacturing processes, from initial smelting or melting through final shaping, coating, and assembly, occurred in the United States.
- D. Plastic and polymer-based products. All manufacturing processes, from initial combination of constituent plastic or polymer-based inputs, or, where applicable, constituent composite materials, until the item is in its final form, occurred in the United States.
- E. Glass. All manufacturing processes, from initial batching and melting of raw materials through annealing, cooling, and cutting, occurred in the United States.
- F. Fiber optic cable (including drop cable). All manufacturing processes, from the initial ribboning (if applicable), through buffering, fiber stranding and jacketing, occurred in the United States. All manufacturing processes also include the standards for glass and optical fiber, but not for non-ferrous metals, plastic and polymer-based

products, or any others.

- G. Optical fiber. All manufacturing processes, from the initial preform fabrication stage through the completion of the draw, occurred in the United States.
- H. Lumber. All manufacturing processes, from initial debarking through treatment and planing, occurred in the United States.
- I. Drywall. All manufacturing processes, from initial blending of mined or synthetic gypsum plaster and additives through cutting and drying of sandwiched panels, occurred in the United States.
- J. Engineered wood. All manufacturing processes from the initial combination of constituent materials until the wood product is in its final form, occurred in the United States.

184.7 Build America, Buy America Act Preference waivers.

- A. A Federal agency may waive the application of the Build America, Buy America Act Preference in any case in which it finds that:
 - 1. Applying the Build America, Buy America Act Preference would be inconsistent with the public interest (a “public interest waiver”);
 - 2. Types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality (a “nonavailability waiver”); or
 - 3. The inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall infrastructure project by more than 25 percent (an “unreasonable cost waiver”).
- B. *Requesting a waiver.* Recipients may request waivers from a Federal agency if the recipient reasonably believes a waiver is justified under paragraph (a) of this section. A request from a recipient to waive the application of the Build America, Buy America Act Preference must be provided to the Federal agency in writing. Federal agencies must provide waiver request submission instructions and guidance on the format, contents, and supporting materials required for waiver requests from recipients.
- C. Existing waivers applicable to this Project.
 - 1. The Environmental Protection Agency (EPA) Buy America Compliance requirements, including applicable waivers, are specified under Section 00 90 12.

End of Section

SECTION 00 90 12
EPA BUY AMERICA COMPLIANCE

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes requirements for compliance with **EPA Buy America provisions** for federally funded infrastructure projects.
- B. The EPA funding for this Project is subject to the following compliance documentation requirements and procedures for:
 - 1. Multi-agency Tribal Public Interest Waiver
 - 2. De Minimis Cost Waiver
 - 3. Minor Components Waiver
- C. This Section establishes documentation procedures for contractor demonstration of compliance with Buy America requirements applicable to iron, steel, manufactured products, construction materials, and Section 70917(c) materials.

1.2 RELATED REQUIREMENTS

- A. Division 01 – General Requirements.
- B. Section 01 29 73 - Schedule of Values
- C. Section 01 29 76 – Application for Payment.
- D. Section 01 33 00 – Submittal Procedures.
- E. Section 00 90 10 - Buy America Preferences.

1.3 REFERENCES

- A. Federal Infrastructure Investment and Jobs Act (IIJA) Buy America provisions as applied to Denali Commission projects
- B. Office of Management and Budget (OMB) Memorandum M-24-02.
- C. 2 CFR Part 184 – Buy America Preferences for Infrastructure Projects.

1.4 DEFINITIONS

- A. **Construction Materials:** Articles, materials, or supplies consumed in, incorporated into, or affixed to an infrastructure project.
- B. **Minor Components:** Components of an iron or steel product that collectively represent a small portion of total product cost.
- C. **De Minimis Allowance:** Cost-based exception permitting limited use of non-domestic materials below specified percentage thresholds.
- D. **Multi-agency Tribal Public Interest Waiver:** EPA waiver allowing use of manufactured products that do not meet the 55% domestic content requirement of BABA.
- E. **Domestic Content:** Materials manufactured in the United States with required domestic component percentages.

1.5 BUY AMERICA COMPLIANCE REQUIREMENTS

- A. The Contractor shall ensure that all iron, steel, manufactured products, and construction materials incorporated into the Project comply with **EPA Buy America requirements** unless permitted under the following allowances:
1. De Minimis Waiver
<https://www.epa.gov/system/files/documents/2022-10/EPA%20BABA%20De%20Minimis%20Waiver%20Final%20Oct%202022.pdf>
 2. Minor (Ferrous) Components for Iron and Steel Products Waiver
<https://www.epa.gov/system/files/documents/2023-04/BABA%20Minor%20Components%20Waiver.pdf>
 3. Multi-agency Tribal Public Interest Waiver
<https://www.epa.gov/system/files/documents/2025-01/multi-agency-tribal-public-interest-waiver-final.pdf>
- B. The Contractor is responsible for tracking material origin and maintaining documentation demonstrating compliance.
- C. The Contractor shall not incorporate non-domestic materials without prior written approval from the Authority.

1.6 DE MINIMIS ALLOWANCE (Iron, Steel, Manufactured Products, Construction Materials)

- A. Non-domestic materials may be used under the De Minimis allowance provided that:
1. Total cost of such materials does not exceed **5 percent of total project cost**. *For this Project the total De Minimis Cost cannot exceed \$267,000.*

1.7 MINOR (FERROUS) COMPONENTS FOR IRON AND STEEL WAIVER

- A. Minor components within domestically produced iron and steel may be of foreign origin provided that:
1. Foreign components collectively represent **less than 5 percent of total material cost**, and
 2. The iron and steel is otherwise produced in the United States.

1.8 MULTI-AGENCY TRIBAL PUBLIC INTEREST WAIVER (Manufactured Prods)

- A. The EPA multi-agency Tribal Public Interest Waiver allows the use of non-compliant *Manufactured Products*, regardless of Federal financial assistance amount.
- B. The waiver does NOT apply to *Iron and Steel Products or Construction Materials*, which shall comply fully with Buy America domestic manufacturing requirements unless otherwise authorized.

1.9 CONTRACTOR DOCUMENTATION REQUIREMENTS

The Contractor shall track and document the origin of all *Iron and Steel Products and Construction Materials* incorporated into the Project and submit and maintain documentation sufficient to demonstrate compliance with Buy America requirements and applicable waivers.

A. Material Origin Certification

For each applicable product submit:

1. Product description
2. Manufacturer name and location.
3. Manufacturing facility address.
4. Country of origin.
5. Statement indicating whether material qualifies under:
 - i. Domestic production requirements
 - ii. De Minimis allowance
 - iii. Minor components allowance
 - iv. Multi-Agency Tribal Public Interest Waiver

B. Domestic Manufacturing Certification

Submit signed certification from manufacturer or supplier confirming:

1. Iron and steel were melted, poured and coated in the United States.
2. Construction materials were produced in the United States.

C. De Minimis Tracking Log

The Contractor shall maintain and submit a cumulative log including:

1. Item description
2. Supplier
3. Country of origin
4. Cost of material
5. Running total of foreign material cost
6. Percentage relative to Total Project Cost

D. Minor (Ferrous) Components Documentation

Submit:

1. Identification of manufactured product
2. List of foreign minor components
3. Cost breakdown showing total component cost
4. Percentage of minor components relative to total product cost

E. Multi-Agency Tribal Public Interest Waiver Compliance Documentation

The Contractor shall maintain and submit a cumulative log for each manufactured product that qualifies under this waiver, including:

1. Item description (documenting the item is a Manufactured Product)
2. Supplier
3. Country of origin

F. Buy America Compliance Documentation

1. The Contractor shall submit a BABA Compliance Tracking Log that tracks and documents all iron, steel, manufactured products, construction materials, and Section 70917(c) materials provided under this waiver, including:

- i. BABA Material Category
- ii. Description of material or product
- iii. Manufacturer and Supplier
- iv. Country of origin
- v. BABA Status
- vi. Waiver type (as applicable)

1.10 SUBMITTALS

A. Prior to incorporation of materials into the Work submit the following:

1. Buy America Compliance Certification.
2. Material Origin Certifications.
3. De Minimis Log.
4. Minor Component Certification.
5. Muti-Agency Tribal Public Interest Waiver Log.
6. Buy America Compliance Tracking Log.

B. Prior to Substantial Completion submit the following:

1. Final EPA BABA Compliance Project Material Tracking Log
2. Final EPA BABA De Minimis Tracking Log
3. Final EPA BABA Contractor Certification

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 COMPLIANCE VERIFICATION

- A. Authority or Authority's Representative may audit contractor records at any time.
- B. The Contractor shall maintain documentation for **minimum five years after project completion and final payment.**
- C. Materials lacking documentation may be rejected.

3.2 NON-COMPLIANT MATERIALS

- A. If non-compliant materials are identified:
 - 1. The Contractor shall remove and replace materials at no additional cost to Authority, or
 - 2. The Contractor shall obtain written approval from the Authority documenting applicability of waiver provisions.

The following forms are attached at the end of this section for reference. Editable DOCX and XLXS versions can be provided to the successful bidder after contract award.

Attachment A EPA BABA Compliance Project Material Tracking Log

Attachment B EPA BABA De Minimis Tracking Log

Attachment C EPA BABA Contractor Certification

Attachment D EPA BABA Manufacturer Certification

Attachment E EPA BABA Supplier Certification

Attachment F EPA BABA Minor Components Certification

Attachment A - EPA BABA Compliance Material Tracking Log

Project Name: **Tuluksak Bulk Fuel Upgrades Project**

Project Location: **Tuluksak, Alaska, 99679**

Denali Commission Award Number: **FAA 1974**

(EPA BABA Waivers flowdown through FAA 1974 and ANTHC 26-J-12686)

AEA Contract Award Number: **AEA ITB 26078**

Item #	Product/Item	Material Category	Supplier	Manufacturer	Country of Manufacture	BABA Status	Waiver Type	Documentation Provided
1	Bulk Tank	Iron & Steel Product	Anchorage Tank	Steel Co.	USA	Compliant	None	Manufactureres Compliance Cert
2	Control Panels	Manufactured Product	Stusser	Square D	Various	Waiver	Multi-Agency Tribal Waiver	Manufactureres Compliance Cert
3	Conductors	Construction Material	Northcoast	Southwire	USA	Compliant	None	Manufactureres Compliance Cert
4	Cement	Section 70917(c)	Anchorage Concrete	Cemex USA	USA	Exempt	None	Exempt

Tracking Log Notes:

- 1) Classify the item into one of the four BABA Categories: Iron and Steel, Manufactured Product, Construction Material, or Section 70917(c) materials
- 2) Identify the Product/Item
- 3) Identify the Item Manufacturer
- 4) Where is the Item Manufactured (Country)
- 5) BABA Compliance Status - Compliant or Waiver
- 6) None = Compliant, or list Waiver Type (Partial Public Interest, De Minimis or Minor Components)
- 7) List the Supplier
- 8) List and attached Compliance/Waiver documentation

Authorized Representative

Name:

Title:

Company:

Signature:

Date:

Attachment B - EPA BABA De Minimis Tracking Log

Project Name: **Tuluksak Bulk Fuel Upgrades Project**

Project Location: **Tuluksak, Alaska, 99679**

Denali Commission Award Number: **FAA 1974**

(EPA BABA Waivers flowdown through FAA 1974 and ANTHC 26-J-12686)

AEA Contract Award Number: **AEA ITB 26078**

\$267,500 Total project material costs subject to EPA Buy America De Minimis Waiver

Item #	Material / Product	Supplier	Country of Manufacture	Quantity	Unit Cost	Total Cost
1	Bolts	AIH	China	20	\$0.50	\$10.00
2	Nails	SBS	Taiwan	50	\$5.00	\$250.00
3						\$0.00
4						\$0.00
5						\$0.00
6						\$0.00
7						\$0.00
8						\$0.00
Total De Minimis Cost						\$260.00
Percent						0.1%

Tracking Log Notes:

Enter Total Project Material Costs subject to BABA Preferences in Cell A8

Confirm Percent <= 5% in Cell G19

Non-domestic materials may be used under the De Minimis allowance provided that:

The total cost of waived materials does not exceed **5 percent of total project cost**, and

The cumulative value doesn't exceed: **\$267,500**

Authorized Representative

Name:

Title:

Company:

Signature:

Date:

ATTACHMENT C - BUILD AMERICA, BUY AMERICA (BABA) - CONTRACTOR CERTIFICATION

Project Name: **Tuluksak Bulk Fuel Upgrades Project**

Project Location: **Tuluksak, Alaska, 99679**

Denali Commission Award Number: **FAA 1974**

(EPA BABA Waivers flowdown through FAA 1974 and ANTHC 26-J-12686)

Contract Number: **AEA ITB 26078**

Certification Statement

The undersigned certifies that all iron, steel, manufactured products, and construction materials incorporated into the above-referenced project funded by the Denali Commission comply with the requirements of the Build America, Buy America Act (2 CFR Part 184), except where a specific waiver has been approved.

The contractor further certifies that:

1. All required BABA documentation has been collected from manufacturers, suppliers, and subcontractors.
2. Documentation is maintained in the project file and available for review by the funding agency or authorized federal auditors.
3. Any materials not meeting domestic sourcing requirements are documented under an approved waiver, including **EPA's multi-agency Tribal Public Interest, De Minimis or Minor Components Waivers**, when applicable.

Contractor Name: _____

Authorized Representative

Name: _____

Title: _____

Signature: _____

Date: _____

ID Number: _____

ATTACHMENT D - BUILD AMERICA, BUY AMERICA (BABA) - MANUFACTURER COMPLIANCE CERTIFICATE

Project Name: **Tuluksak Bulk Fuel Upgrades Project**

Project Location: **Tuluksak, Alaska, 99679**

Denali Commission Award Number: **FAA 1974**

(EPA BABA Waivers flowdown through FAA 1974 and ANTHC 26-J-12686)

Contract Number: **AEA ITB 26078**

Product Information

Product Name: _____

Model / Type: _____

Material Category:

- Iron or Steel
- Manufactured Product
- Construction Material

Country of Final Manufacture: _____

Manufacturing Facility Location: _____

Certification

The undersigned certifies that the product listed above:

Meets Build America, Buy America domestic content requirements.

or

Does not meet BABA domestic content requirements but is provided under one of the following

EPA Waivers (Circle one):

- Multi-agency Tribal Public Interest Waiver,
- De Minimis,
- Minor Components.

The manufacturer certifies that this statement is accurate to the best of their knowledge and understands that false statements may be subject to penalties under federal law.

Manufacturer Name: _____

Authorized Representative

Name: _____

Title: _____

Signature: _____

Date: _____

ID Number: _____

ATTACHMENT E - BUILD AMERICA, BUY AMERICA (BABA) - SUPPLIER CERTIFICATION

Project Name: **Tuluksak Bulk Fuel Upgrades Project**

Project Location: **Tuluksak, Alaska, 99679**

Denali Commission Award Number: **FAA 1974**

(EPA BABA Waivers flowdown through FAA 1974 and ANTHC 26-J-12686)

Contract Number: **AEA ITB 26078**

The supplier/distributor certifies that all products supplied for the referenced **federally funded** project:

1. Are accompanied by manufacturer certifications verifying compliance with the Build America, Buy America Act; OR
2. Are documented under an approved waiver applicable to the project.

The supplier confirms that the documentation provided accurately reflects the source and manufacturing location of the materials supplied.

Supplier Name: _____

Authorized Representative

Name: _____

Title: _____

Signature: _____

Date: _____

ID Number: _____

**ATTACHMENT F - BUILD AMERICA, BUY AMERICA (BABA) – MINOR COMPONENTS
CERTIFICATE**

Project Name: **Tuluksak Bulk Fuel Upgrades Project**

Project Location: **Tuluksak, Alaska, 99679**

Denali Commission Award Number: **FAA 1974**

(EPA BABA Waivers flowdown through FAA 1974 and ANTHC 26-J-12686)

Contract Number: **AEA ITB 26078**

Product Information

Product Name: _____

Model / Type: _____

Country of Final Manufacture: _____

Manufacturing Facility Location: _____

Certification

The undersigned certifies that for the product listed above:

The item is an **iron or steel product manufactured in the United States**, including melting and/or pouring of iron and steel and all subsequent manufacturing processes occurring domestically.

The item may include **miscellaneous minor iron or steel (ferrous) components** that are of **non-domestic or unknown origin**.

Such minor components are **incidental to the product** and do not constitute primary structural or functional elements.

The total material cost of these minor ferrous components **does not exceed five percent (5%) of the total material cost of the product**.

The manufacturer certifies that this statement is accurate to the best of their knowledge and understands that false statements may be subject to penalties under federal law.

Manufacturer Name: _____

Authorized Representative

Name: _____

Title: _____

Signature: _____

Date: _____

ID Number: _____

SECTION 01 11 13
SUMMARY OF WORK

PART 1 – GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Contract Method.
- B. Work by Others.
- C. Coordination.
- D. Work covered by Contract Documents.

1.2 RELATED REQUIREMENTS:

- A. Section 00 70 00 – General Conditions.
- B. Section 00 80 00 – Supplementary Conditions.
- C. Division 1
- D. Divisions 2 through 33

1.3 CONTRACT METHOD

- A. This Contract is 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.

1.4 WORK BY OTHERS

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

1.5 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.

1.6 WORK COVERED BY CONTRACT DOCUMENTS

- A. 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.
- B. The following general requirements apply to the Base Bid.
 - 1. Receive Owner Furnished Materials in accordance with Section 01 64 00.
 - 2. Furnish all other required equipment and materials.

3. Mobilize all required materials, equipment, tools, supplies, etc. and all required personnel to the project site(s) in Tuluksak, AK.
 4. Obtain written agreement to procure fill to use for Classified Fill and Bedding Material.
 5. Prepare a Stormwater Pollution Prevention Plan (SWPPP), file a Notice of Intent/Termination, and implement/comply with the plan for the duration of construction. See Section 31 23 19.
 6. Locate existing survey control, mark property boundaries, locate existing utilities, and lay out work areas. See Section 01 71 23.16.
 7. Maintain temporary fuel systems as required to maintain regular operations of power plant, school, and retail fuel sales operations.
 8. Provide advance written notice to the Authority in accordance with Section 01 77 00 - Contract Closeout Procedures to schedule substantial completion inspection. Prior to declaring the project substantially complete: perform all required tests of mechanical and electrical systems; submit test reports to the Authority; flush and charge all piping systems; and perform all other tasks required to prepare project for commissioning. Document completion by filling out the Engineer-approved, Pre-Commissioning Substantial Completion Inspection Checklist and submitting to the Authority.
 9. 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.
 10. Correct all deficiencies noted in the Substantial Completion Inspection punchlist. Provide photographic documentation of corrections to the Authority.
 11. Upon substantial completion acceptance, test and commission all systems in accordance with an engineer approved commissioning checklist.
 12. Upon completion remove all Contractor tools and equipment from the project site, thoroughly clean all work areas, remove all rubbish and debris, and dispose of all waste in accordance with the Contract Documents.
- C. Upon completion of commissioning the Contractor shall:
1. Clean up the jobsite, remove and properly dispose of all trash and debris associated with construction.
 2. Deliver all materials and equipment taken out of service as a result of decommissioning and/or demolition to the local storage area or landfill, as directed by the Owner.
 3. Remove all Contractor tools and equipment from the project site.
- D. Work under this Contract is defined under Base Bid as described in the paragraphs that follow.

1.7 Description of Bid Items

1.7.1 Schedule A – Base Bid – Co-Located Bulk Fuel Upgrades

- A. Bid Item A1: Mobilization/Demobilization
1. The unit price Bid for Mobilization/Demobilization shall include all mobilization and demobilization costs associated with construction of the basic bid items described in Bid Schedule A and must include the following principal items performed or established in accordance with the Contract Documents:
 - a. Pre-construction and post-construction costs of obtaining all required bonds, insurance, and permits, and other costs Contractor must incur before beginning the Work.
 - b. Transportation of all materials, supplies, plant(s), equipment and personnel to and from the jobsite.
 - c. Erecting and maintaining all plants, temporary structures, storage yards erosion control measures, and other construction facilities, and for Work required to remove said temporary facilities and perform cleanup of the project area in accordance with Section 01 50 00 Construction Facilities and Temporary Controls and Section 01 57 13 Temporary Erosion and Sediment Control.
 - d. Obtaining and paying for all permits required of the Contractor.
 - e. Posting all OSHA-required notices and establishing safety programs.
 - f. Submittal of required Project Schedules.
 2. Mobilization/Demobilization costs for all subcontracted work shall be considered to be included.
 3. Items which are not to be included in this item include:
 - a. Any portion of the Work covered by specific Bid item or incidental work which is to be included in a Bid item or items.
 - b. Profit, Interest on borrowed money, overhead or management costs.
 4. Method of Measurement: Payment for mobilization and demobilization will be made in partial payments as follows:
 - a. Up to 60% of the amount bid for mobilization and demobilization may be paid when equipment and supplies are landed in serviceable condition at the project site and other necessary

preparations have been completed so that work can commence.

- b. The remaining balance will be paid as Contractor facilities are dismantled and equipment is removed from the project site, with the final increment paid upon completion of demobilization. The owner reserves the right to require Contractor to submit invoices, payroll records, and other appropriate documentation to substantiate any or all payments under this item.

5. Basis of Payment: Payment will be made at the Contract Lump Sum price for mobilization / demobilization.

B. Bid Item A2: Co-Located Tank Farm Civil Site Work

1. The unit price Bid for Co-Located Tank Farm Civil Site Work shall include full payment for all labor, material, transportation, freight, and equipment required to:

- a. Complete all Earthwork Related to the Co-Located Facilities as shown on the design drawings: Activities to complete this task include all clearing and grubbing, waste disposal, removal/relocation of construction debris, building materials that would interfere with construction, dewatering, surface preparation, stockpiling, excavation, erosion control, placement, compaction and finish grading of classified fill as required to construct foundation pad and access drives for the community bulk fuel tank farm and related facilities, in accordance with the Contract Drawings and Specifications.

2. Items which are not to be included in this bid item are listed below:

- a. Any portion of the Work covered by separate Bid item or incidental work.
- b. Fence, containment dikes, tank farm membrane liner systems and classified fill within containment dikes.

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

C. Bid Item A3: Co-Located Bulk Fuel Tank Farm

1. The unit price Bid for the Co-Located Bulk Fuel Tank Farm shall include full payment for all labor, material and equipment required to:

- a. Construct Co-Located Secondary Containment System: Activities to complete this task include furnishing and installing pre-engineered steel containment dike, geotextile and liner, drainage piping and sumps, stairways and platforms, and placement, compaction and finish grading of classified fill as required to construct a fully functional lined secondary containment system in accordance with the

Contract Drawings and Specifications.

- b. Install Co-Located Tanks, Tank Foundations, and Mechanical Equipment: Activities to complete this task include transporting and installing above ground storage tanks and procuring, transporting, and installing dispensing systems, venting, gauging, water draw, pressure relief, and other appurtenances, timber and concrete foundations, meters, dispensers, hose reels, piping, valves, fittings, tags, and related appurtenances, distribution pipelines and supports, interconnections at the power plant and water plant, all fencing, and mechanical systems and controls, fire extinguishers, signs and placards, and other components as required to provide complete, fully functional bulk fuel storage, dispensing, and distribution facilities in accordance with the Contract Drawings and Specifications.
- c. Provide a new or like-new 8' x 20' connex van modified to function as an attendant kiosk as shown on the contract drawings.
- d. Provide temporary bulk storage and dispensing facilities as necessary to maintain normal operations at the community power plant, water plant, and retail sales operations. Coordinate with all tank owners prior to construction to ensure that sufficient fuel storage, transfer, and retail dispensing capabilities are maintained throughout construction.

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

D. Bid Item A4: Electrical Systems

1. The unit price Bid shall include but not be limited to full payment for all labor, material and equipment required to:
 - a. Construct co-located electrical systems and controls including control panels, conduit, conductors, lighting, grounding systems, motor starters, pumps & level switches, communication systems, point of sale systems, and all related items. Contractor to coordinate new electrical service to the facility with local power utility and pay for all associated connection fees. Furnish and install all electrical systems as required to provide complete, fully functional bulk fuel and dispensing facilities in accordance with the Contract Drawings and Specifications.
2. Measurement for payment shall be lump sum complete in-place

- E. Bid Item A5: Spill Response Equipment:
1. The unit price Bid for Spill Response Equipment shall include but not be limited to full payment for all labor, material and equipment required to:
 - a. Provide Co-Located spill response gear within a like-new connex van: Activities to complete this task include, the procurement of an 8-ft by 20-ft, like new weather-tight connex van and all required spill response equipment listed in the Contract Documents, packaging of the spill response equipment within the connex van, delivery, construction of shelving, and placement of the filled connex van in accordance with the Contract Drawings and Specifications.
 2. Paint connex IAW with the coating specification for Miscellaneous Steel Structures.
 3. Measurement for payment shall be lump sum complete in-place
- F. Bid Item A6: Filter / Transfer Fuel & Decommission Existing Tank Farms
1. The unit price Bid for Filter / Transfer Fuel & Decommission Existing Tank Farms shall include full payment for all labor, material and equipment required to:
 - a. Decommission existing Corporation and TNL tanks: Activities to complete this task shall include visual inspection, filtering (particulate and water removal) and transferring all useable product from the tanks to be decommissioned to the appropriate new tanks, removing, filtering, and properly disposing of any accumulated oily water in the tanks, transfer of any accumulated sludge into 55-gallon steel barrels, cleaning the inside of the tanks, proper disposal of all rinsate and other waste materials generated during cleaning of the tanks, disconnecting and blanking off all piping connected to the tanks to be decommissioned, closing all penetrations with the exception of a vent, and posting a sign on each tank stating that the tank is permanently closed and noting the date of closure in accordance with the Contract Drawings and Specifications.
 - b. Important Note: Contractor is solely responsible for coordination with tank farm Owners and must obtain written authorization from tank owners prior to any transfer of fuel between tanks. Contractor shall follow all code mandated procedures and regulations relating to fuel transfers. See Decommissioning Sheets for additional information on existing tank farms.

- c. Decommission existing TNL and Corporation above grade pipelines: Activities to complete this task include disconnecting piping from all tanks and appliances, purging piping and properly disposing of all liquids and sludges, removing and disposing of all pumps, valves, and other pipeline appurtenances unless tagged for salvage, cutting of all piping into maximum 10 ft lengths and transporting and neatly stacking the cut pieces at a location within the existing tank farm as directed by the Owner and in accordance with the Contract Drawings and Specifications.
 2. Measurement for payment shall be lump sum complete in-place.
- G. Bid Item A7: Manifesting, Transport and Disposal of RCRA Hazardous Waste
 1. The unit price Bid for Manifesting, Transport and Disposal of RCRA Hazardous Waste shall include full payment for all labor, material and equipment required to:
 - a. Test, Label, Manifest, Transport and Dispose of sludge removed from the TNL and Corporation tanks and confirmed by certified testing lab to be a RCRA Hazardous Waste: Activities to complete this task shall include all sample collection, transport and laboratory testing costs, sealing the steel 55 gallon drums containing RCRA hazardous waste in approved overpack drums, labelling each overpack drum with the name of the tank owner, completion of all required forms, manifests and other applicable documentation, transportation of sealed drums to an approved disposal facility and payment of all related handling and disposal fees in accordance with the Contract Drawings and Specifications.
 - b. Sludge from tanks with differing owners shall not be mixed. The volume of each drum shall be utilized to the fullest practical extent. Partially full drums shall be avoided whenever possible.
 2. Measurement for payment shall be per full 55-gallon drum sealed within appropriate over pack drum and delivered to an approved disposal site.
- H. Bid Item A8: Transport and Disposal of State Regulated Non-Hazardous Waste
 1. The unit price Bid for Transport and Disposal of State Regulated Non-Hazardous Waste shall include full payment for all labor, material and equipment required to:
 - a. Test, label, transport and dispose of sludge removed from the TNL and Corporation tanks and confirmed by certified testing lab to be State Regulated Non-RCRA Hazardous Waste: Activities to complete this task shall include all sample collection, transport and laboratory testing costs, completion of all required forms, manifests

- and other applicable documentation, transportation to an approved disposal facility and payment of all related handling and disposal fees in accordance with the Contract Drawings and Specifications.
- b. Sludge from tanks with differing owners shall not be mixed. The volume of each drum shall be utilized to the fullest practical extent. Partially full drums shall be avoided whenever possible.
2. Measurement for payment shall be per full 55-gallon drum delivered to an approved disposal site.

1.7.2 Schedule B – Base Bid – School Bulk Fuel Upgrades

- A. Bid Item B1: School - Mobilization/Demobilization
 2. The unit price Bid for School - Mobilization/Demobilization shall include all mobilization and demobilization costs associated with construction of the basic bid items described in Bid Schedule B and must include the following principal items performed or established in accordance with the Contract Documents:
 - a. Pre-construction and post-construction costs of obtaining all required bonds, insurance, and permits, and other costs Contractor must incur before beginning the Work.
 - b. Transportation of all materials, supplies, plant(s), equipment and personnel to and from the jobsite.
 - c. Erecting and maintaining all plants, temporary structures, storage yards erosion control measures, and other construction facilities, and for Work required to remove said temporary facilities and perform cleanup of the project area in accordance with Section 01 50 00 Construction Facilities and Temporary Controls and Section 01 57 13 Temporary Erosion and Sediment Control.
 - d. Obtaining and paying for all permits required of the Contractor.
 - e. Posting all OSHA-required notices and establishing safety programs.
 - f. Submittal of required Project Schedules.
 6. Mobilization/Demobilization costs for all subcontracted work shall be considered to be included.
 7. Items which are not to be included in this item include:

- c. Any portion of the Work covered by specific Bid item or incidental work which is to be included in a Bid item or items.
 - d. Profit, Interest on borrowed money, overhead or management costs.
 - 8. Method of Measurement: Payment for mobilization and demobilization will be made in partial payments as follows:
 - a. Up to 60% of the amount bid for mobilization and demobilization may be paid when equipment and supplies are landed in serviceable condition at the project site and other necessary preparations have been completed so that work can commence.
 - b. The remaining balance will be paid as Contractor facilities are dismantled and equipment is removed from the project site, with the final increment paid upon completion of demobilization. The owner reserves the right to require Contractor to submit invoices, payroll records, and other appropriate documentation to substantiate any or all payments under this item.
 - 9. Basis of Payment: Payment will be made at the Contract Lump Sum price for mobilization / demobilization.
- B. Bid Item B2: School - Tank Farm Civil Site Work
 - 1. The unit price Bid for School - Tank Farm Civil Site Work shall include full payment for all labor, material, transportation, freight, and equipment required to:
 - a. Complete all Earthwork Related to the School Facilities as shown on the design drawings: Activities to complete this task include all clearing and grubbing, waste disposal, removal/relocation of construction debris, building materials that would interfere with construction, dewatering, surface preparation, stockpiling, excavation, erosion control, placement, compaction and finish grading of classified fill as required to construct foundation pad and access drives for the community bulk fuel tank farm and related facilities, in accordance with the Contract Drawings and Specifications.
 - 2. Items which are not to be included in this bid item are listed below:
 - c. Any portion of the Work covered by separate Bid item or incidental work.

- d. Fence, containment dikes, tank farm membrane liner systems and classified fill within containment dikes.
3. Measurement for payment shall be lump sum complete in-place.
- C. Bid Item B3: School - Bulk Fuel Tank Farm
 1. The unit price Bid for School - Bulk Fuel Tank Farm shall include full payment for all labor, material and equipment required to:
 - e. Construct School Secondary Containment System: Activities to complete this task include furnishing and installing pre-engineered steel containment dike, geotextile and liner, drainage piping and sumps, stairways and platforms, and placement, compaction and finish grading of classified fill as required to construct a fully functional lined secondary containment system in accordance with the Contract Drawings and Specifications.
 - f. Install School Tanks, Tank Foundations, and Mechanical Equipment: Activities to complete this task include transporting and installing above ground storage tanks and procuring, transporting, and installing fleet dispensing systems, venting, gauging, water draw, pressure relief, and other appurtenances, timber and concrete foundations, meters, dispensers, hose reels, piping, valves, fittings, meters, tags, and related appurtenances, buried and above grade transfer piping and interconnections at the existing school intermediate tank, all fencing, and mechanical systems and controls, fire extinguishers, signs and placards, and other components as required to provide complete, fully functional bulk fuel tank farm and associated fleet dispensing and fuel distribution systems in accordance with the Contract Drawings and Specifications.
 - g. Provide end use tanks for teacher housing and other structures as shown in the contract documents.
 - h. Provide temporary bulk storage, transfer, and dispensing facilities as necessary to maintain normal operations at school campus. Coordinate with all tank owners prior to construction to ensure that sufficient fuel storage, transfer, and dispensing capabilities are maintained throughout construction.
 2. Measurement for payment shall be lump sum complete in-place.
- D. Bid Item B4: School - Electrical Systems
 1. The unit price Bid for School – Electrical Systems shall include but not be limited to full payment for all labor, material and equipment required to:

- a. Construct School electrical systems and controls including control panels, conduit, conductors, lighting, grounding systems, motor starters, pumps & level switches, communication systems, point of sale systems, and all related items. Contractor to coordinate new electrical service to the facility with local power utility and pay for all associated connection fees. Furnish and install all electrical systems as required to provide complete, fully functional bulk fuel storage, distribution, and dispensing facilities in accordance with the Contract Drawings and Specifications.
 2. Measurement for payment shall be lump sum complete in-place
- E. Bid Item B5: School - Spill Response Equipment:
1. The unit price Bid for School - Spill Response Equipment shall include but not be limited to full payment for all labor, material and equipment required to:
 - a. Provide School spill response gear within a like-new connex van: Activities to complete this task include, the procurement of an 8-ft by 20-ft, like new weather-tight connex van and all required spill response equipment listed in the Contract Documents, packaging of the spill response equipment within the connex van, delivery, construction of shelving, and placement of the filled connex van in accordance with the Contract Drawings and Specifications.
 2. Paint connex IAW with the coating specification for Miscellaneous Steel Structures.
 3. Measurement for payment shall be lump sum complete in-place
- F. Bid Item B6: School - Filter / Transfer Fuel & Decommission Existing Tank Farms
1. The unit price Bid for School - Filter / Transfer Fuel & Decommission Existing Tank Farms shall include full payment for all labor, material and equipment required to:
 - a. Decommission existing School tanks: Activities to complete this task shall include visual inspection, filtering (particulate and water removal) and transferring all useable product from the tanks to be decommissioned to the appropriate new tanks, removing, filtering, and properly disposing of any accumulated oily water in the tanks, transfer of any accumulated sludge into 55-gallon steel barrels, cleaning the inside of the tanks, proper disposal of all rinsate and other waste materials generated during cleaning of the tanks,

- disconnecting and blanking off all piping connected to the tanks to be decommissioned, closing all penetrations with the exception of a vent, and posting a sign on each tank stating that the tank is permanently closed and noting the date of closure in accordance with the Contract Drawings and Specifications.
- b. Important Note: Contractor is solely responsible for coordination with tank farm Owners and must obtain written authorization from tank owners prior to any transfer of fuel between tanks. Contractor shall follow all code mandated procedures and regulations relating to fuel transfers. See Decommissioning Sheets for additional information on existing tank farms.
 - c. Decommission existing School above grade pipelines: Activities to complete this task include disconnecting piping from all tanks and appliances, purging piping and properly disposing of all liquids and sludges, removing and disposing of all pumps, valves, and other pipeline appurtenances unless tagged for salvage, cutting of all piping into maximum 10 ft lengths and transporting and neatly stacking the cut pieces at a location within the existing tank farm as directed by the Owner and in accordance with the Contract Drawings and Specifications.
2. Measurement for payment shall be lump sum complete in-place.
- G. Bid Item B7: School - Manifesting, Transport and Disposal of RCRA Hazardous Waste
- 3. The unit price Bid for School - Manifesting, Transport and Disposal of RCRA Hazardous Waste shall include full payment for all labor, material and equipment required to:
 - a. Test, Label, Manifest, Transport and Dispose of sludge removed from the school tanks and confirmed by certified testing lab to be a RCRA Hazardous Waste: Activities to complete this task shall include all sample collection, transport and laboratory testing costs, sealing the steel 55 gallon drums containing RCRA hazardous waste in approved overpack drums, labelling each overpack drum with the name of the tank owner, completion of all required forms, manifests and other applicable documentation, transportation of sealed drums to an approved disposal facility and payment of all related handling and disposal fees in accordance with the Contract Drawings and Specifications.
 - b. Sludge from tanks with differing owners shall not be mixed. The volume of each drum shall be utilized to the fullest

practical extent. Partially full drums shall be avoided whenever possible.

4. Measurement for payment shall be per full 55-gallon drum sealed within appropriate over pack drum and delivered to an approved disposal site.
- H. Bid Item B8: School - Transport and Disposal of State Regulated Non-Hazardous Waste
3. The unit price Bid for School - Transport and Disposal of State Regulated Non-Hazardous Waste shall include full payment for all labor, material and equipment required to:
 - c. Test, label, transport and dispose of sludge removed from the school tanks and confirmed by certified testing lab to be State Regulated Non-RCRA Hazardous Waste: Activities to complete this task shall include all sample collection, transport and laboratory testing costs, completion of all required forms, manifests and other applicable documentation, transportation to an approved disposal facility and payment of all related handling and disposal fees in accordance with the Contract Drawings and Specifications.
 - d. Sludge from tanks with differing owners shall not be mixed. The volume of each drum shall be utilized to the fullest practical extent. Partially full drums shall be avoided whenever possible.
 4. Measurement for payment shall be per full 55-gallon drum delivered to an approved disposal site.

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
Project Substantial Completion	October 1, 2027
Project Final Completion	November 1, 2027

Note: Completion dates include all Base Bid items.

END OF SECTION

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

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: Tuluksak Bulk Fuel Upgrades

PROJ. #: 26078

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. Refer to Section 00 70 00 – General Conditions, Article 10 for additional requirements including maximum markup rates.
- 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. Refer to Section 00 70 00 – General Conditions, Article 10 for additional requirements. Refer to Section 00 80 00 – Supplementary Conditions, SC-10.6.2 for maximum markup rates.
- 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



REQUEST FOR INFORMATION or INTERPRETATION

Project: Tuluksak Bulk Fuel Upgrades

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



CHANGE ORDER REQUEST (PROPOSAL)

Project: Tuluksak Bulk Fuel Upgrades

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

This page is blank intentionally.

Project No.: 26078

Directive No.: 000

Project Name: Tuluksak Bulk Fuel Upgrades

Scope of this Directive	
<input type="checkbox"/>	Commencement of Work
<input type="checkbox"/>	Suspension of Work
<input type="checkbox"/>	Contract Non-Conformance
<input type="checkbox"/>	Contract Clarification

Contractor: _____

Address: _____

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 BABA COMPLIANCE

- A. This project includes federal funding and is subject to the requirements of the Build America, Buy America Act (BABA). See Section 00 90 10 for BABA requirements. The Schedule of Values must be formatted to properly track project costs based on the funding source and associated BABA compliance requirements. Final schedule of value format and contact subject to approval by the Authority.

1.5 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:

<u>Contract Price</u>	<u>Value for Final Completion</u>	<u>Value for Final Acceptance</u>
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.

1.6 FRONT END LOADING

- B. 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.

1.7 SUBMITTAL

- C. Submit proposed Schedule of Values with updated Construction Project Schedule per specification sections for Summary of Work, Construction Progress Schedule, and Submittals.
- D. Submit Schedule of Values with updated completion percentages sufficiently in advance of each Application for Payment to enable the Authority to resolve differences.

1.8 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 00 90 12 – EPA Buy America Compliance
- E. Section 01 11 13 – Summary of Work.
- F. Section 01 26 63 – Change Procedures.
- G. Section 01 29 73 – Schedule of Values.
- H. Section 01 32 16 - Construction Progress Schedule
- I. 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 BABA Compliance Project Material Tracking Logs and BABA Certification forms.

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).

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 virtually 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 one time per week during active construction.
- 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 two (2) calendar weeks of the contract award the Contractor shall submit a preliminary schedule.
- B. Within one (1) calendar week 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 by noon of the following day whenever possible.
- C. 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.
- D. 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 00 90 10 – Buy America Preferences.
- D. Section 00 90 12 - EPA Buy America Compliance
- E. Section 01 11 13 – Summary of Work.
- F. Section 01 12 19 – Contractor’s Certification of Subcontracts.
- G. Section 01 29 73 – Schedule of Values.
- H. Section 01 29 76 – Application for Payment.
- I. Section 01 32 16 - Construction Progress Schedule.
- J. Section 01 33 23 – Shop Drawings, Product Data, and Samples.
- K. Section 01 45 00 – Quality Control.
- L. Section 01 60 00 – Material and Equipment.
- M. Section 01 73 00 – Execution Requirements.
- N. Section 01 77 00 – Contract Closeout Procedures.
- O. Technical Specifications.
- P. Operations and Maintenance Manuals.
- Q. Equipment Installation Data.

1.3 SUBMITTAL TIMELINE

- A. The Preliminary Submittal Register shall be provided to the Authority within two (2) calendar weeks of the contract award.
- B. All Submittals shall be provided to the Authority within six (6) calendar weeks of the contract award.
- C. If Submittals for specific items cannot be provided with 6 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. Each submittal shall include signed certificates and tracking logs indicating the category that the materials included in that submittal fall under for BABA compliance as specified under Division 0 Buy America Sections. Note that if different items in a specification section fall under different BABA categories those items shall be separately grouped and certified according to their category.
- F. 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.

- G. On the submittal, notify the Authority in writing of any deviations from requirements of the Contract Documents.
- H. Organize the submittals into logical groupings to facilitate the processing of related submittals, such as:
 - 1. By Specification Section number with subdivisions as required for BABA compliance category certification. 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.
- I. 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

- A. Submit full range of manufacturer's standard finishes except when more restrictive requirements are specified, indicating colors, textures and patterns for Authority selection as specified in technical product sections.
- B. Submit samples to illustrate functional characteristics of products, including parts and attachments.
- C. Approved samples which may be used in the Work are indicated in the Specification section.
- D. Samples shall be identified clearly as to material, supplier, pertinent data such as catalog numbers and the use for which they are intended, and otherwise as the Authority may require, to enable the Authority to review the submittal.
- E. Label each sample with identification required for transmittal letter.

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. Alaska Department of Environmental Conservation (ADEC) 18 AAC 75.
 - 9. American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME).

10. American Petroleum Institute (API).
11. American Society of Testing and Materials (ASTM).
12. American Society of Mechanical Engineers (ASME).
13. American Welding Society (AWS).
14. American Institute of Steel Construction (AISC).
15. Manufacturers Standardization Society of the Valve and Fitting Industry (MSS).
16. Steel Structures Painting Council (SSPC).
17. 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 statutes and regulations, all Electrical work falling under the scope of 12 AAC 32.075 shall be performed under the supervision of an Electrical Administrator with a current license in the State of Alaska in the Unlimited Linework Category.
- B. In accordance with Alaska statutes 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.
- C. In accordance with Alaska statutes and regulations, all Mechanical work falling under the scope of 12 AAC 39.212 shall be performed under the supervision of a Mechanical Administrator with a current license in the State of Alaska in the Unlimited Commercial and Industrial Plumbing Category.
- D. The technical specifications require certain work to be performed by experienced workers with special qualifications such as Journeyman Electricians and Certified Pipe Welders. All work shall be performed by qualified personnel in accordance with the technical specifications.

- E. Sub-contractors shall meet the minimum requirements of the technical specifications for their specialty system.

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 tank and piping pressure test, 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.

1.9 FREEZE PROTECTION

- A. Provide freeze protection for components potentially subject to harm due to freezing temperatures.

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



Project: Tuluksak Bulk Fuel Upgrades

Project No.: 26078

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 | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | The substitute will perform adequately and achieve the results called for by the general design. |
| <input type="checkbox"/> | <input type="checkbox"/> | The substitute is similar, of equal substance, suited to the same use, and will provide the same warranty as the product specified. |
| <input type="checkbox"/> | <input type="checkbox"/> | An equivalent source of replacement parts is available. |
| <input type="checkbox"/> | <input type="checkbox"/> | The evaluation and approval of the proposed substitute will not delay the Substantial or Final Completion of the project. |
| <input type="checkbox"/> | <input type="checkbox"/> | Any change in the design necessitated by the proposed substitution will not delay the Substantial or Final Completion of the project. |
| <input type="checkbox"/> | <input type="checkbox"/> | 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. |
| <input type="checkbox"/> | <input type="checkbox"/> | 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 64 00
RECEIPT OF OWNER FURNISHED MATERIALS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. This section describes receipt, unloading, transportation, storage, and handling of materials furnished by the Owner (Authority) for this project as described herein.
- B. See Section 01 11 13 – Summary of Work for delivery dates for Owner Furnished materials.

1.2 RELATED REQUIREMENT

- A. Section 01 11 13 – Summary of Work.

1.3 DESCRIPTION OF OWNER FURNISHED MATERIAL

- A. A list of owner furnished materials for this project is provided in Table 1 below.

TABLE 1

ITEM NUMBER	MATERIAL DESCRIPTION	QTY	UNIT	APPROX. VALUE (EA UNIT)	APPROXIMATE WEIGHT/ DIMENSIONS	FOB POINT & AVAILABILITY DATE
1	30,000-gal single wall, Horizontal, Aboveground Storage Tank	12	EA	\$95,000	12' Ø x 36'	Tuluksak Barge Landing, Above High-Water Mark
2	5,000-gallon, UL-2085, Dual Compartment, Protected Dispensing Tank	1	EA	\$100,000	8.5' Ø x 14.5'	Tuluksak – Adjacent to Proposed New Co-Located Tank Farm Site

Table Notes:

- 1. All other material required for the proper execution and construction of the project shall be provided by the Contractor including all tank appurtenances.
- 2. Tank shop drawings are available upon request.

1.4 ACCEPTANCE OF OWNER FURNISHED MATERIAL

- A. The Contractor shall (1) receive and accept the materials at the FOB location specified in Table 1; (2) inspect all materials to confirm that the materials delivered are in good

condition and the quantities are correct; and (3) execute a receipt for all materials accepted from the Authority. Delinquency in signing material receipts may result in delayed progress payments.

- B. All material furnished by the Authority shall comply with the plans and specifications. All materials which do not meet specifications or are received broken or damaged shall be culled by the Contractor and a report made to the Authority within 5 days of receipt of material as to the number culled and reason for culling.
- C. Delivery of materials is subject to the Alaska Marine Lines (AML) barge sailing schedule; Contractor shall coordinate directly with AML and have representatives on site to receive the shipment in Tuluksak. If the delivery of owner provided materials is delayed, the Contractor's sole remedy and compensation shall be an extension of time not greater than the delay. Any such time extension shall be requested in writing by the Contractor.

1.5 RECEIPT, TRANSPORTING AND STORING OWNER FURNISHED MATERIAL

- A. The Contractor shall receive, transport, and protect all material in accordance with accepted industry standards.
- B. All handling charges required for receiving, loading, unloading, hauling, transporting or storing the material shall be provided by the Contractor.
- C. Any demurrage charges or other fees incurred as a result of the Contractor not receiving, moving and storing the material shall be paid by the Contractor. If the Authority is required to pay these fees, the fees will be deducted from the first Contractor pay request.
- D. The Contractor shall provide proper equipment as necessary to load, unload, and transport Owner furnished material. The equipment shall be rated as required to properly handle the material.

1.6 DAMAGE TO OWNER FURNISHED MATERIAL

- A. Upon receipt of the materials as specified above, the Contractor shall become solely responsible for their care, transportation, storage, and protection. In the event materials are damaged, lost, stolen, or destroyed by any cause whatsoever after the Contractor has signed a receipt for them, their repair or replacement shall be entirely at the Contractor's expense.
- B. All material replaced by the Contractor shall be equal to the material provided by the Authority and shall meet the material purchase specifications.

1.7 STORAGE OF OWNER FURNISHED MATERIAL

- A. The Contractor shall provide secure storage for all Authority furnished material and shall be responsible for transporting the material to the jobsite as required to support the construction schedule.

PART 2 – PRODUCTS (NOT USED)

Tuluksak Bulk Fuel Upgrades
Tuluksak, Alaska

Section 01 64 00
Receipt Of Owner Furnished Materials

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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 four (4) 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 71 23.16
CONSTRUCTION SURVEYING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Construction surveying requirements.

1.2 RELATED REQUIREMENTS

- A. Existing survey data and survey control are presented on the Drawings.
- B. Available electronic survey data is available to the contractor upon request.
- C. Section 01 33 00 – Submittal Procedures.

1.3 SUBMITTALS

- A. Upon request of the Authority, submit copies of all field notes and survey data.
- B. Provide marked-up as-built drawings.

PART 2 – PRODUCTS

2.1 SURVEY MATERIALS

- A. Provide all construction surveying and staking materials to stake construction work.

PART 3 – EXECUTION

3.1 SURVEYING BY ENGINEER

- A. No surveying will be provided by the Engineer.

3.2 CONTRACTOR RESPONSIBILITIES

- A. Contractor shall set all lines and grades by instrument survey in order to correctly layout the following:
 - 1. Foundations, dikes, tanks, etc..
 - 2. Pipelines, powerlines, and other similar utilities.
 - 3. All other Construction.
- B. Contractor shall provide vertical and horizontal as-built locations of buried utilities.
- C. Contractor shall locate and protect all survey reference points. Contractor shall have a Professional Land Surveyor, licensed in the State of Alaska, reset any survey points that have been disturbed at Contractor's expense.
- D. Survey shall be tied to the basis of horizontal and vertical control indicated on the Drawings.
- E. Contractor shall provide and pay for all surveying as required for project completion and acceptance.

- F. Field-adjust grades to meet the minimum fill depth required by the Drawings.

3.3 ACCURACY AND TOLERANCES

- A. Contractor's surveys shall be subject to the following tolerances, unless another tolerance is specified elsewhere in the Contract Documents:
 - 1. Building Foundation: $\pm 1/4$ -inch in 10 foot.
 - 2. All other Construction:
 - a. ± 0.10 feet horizontally.
 - b. ± 0.10 feet vertically.

3.4 RECORDS

- A. Maintain a complete, accurate, and reduced set of field notes of all survey work and submit all notes to the Authority at the conclusion of work and as requested.

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 specific equipment 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 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 Owner 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 including electrical and mechanical systems.
 - 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 ten (10) calendar days in advance of the Substantial Completion inspection date.
 2. All equipment and systems have been tested, adjusted, are properly operating and fully functional.
 3. 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, maintenance materials receipts.
 - 5. Contractor's transmittal letter: Keys & keying schedule.
 - 6. Contractor's certification of insurance.
 - 7. Submittals and miscellaneous registers.
 - 8. Original final pay estimate.
 - 9. Contractor's release.
 - 10. Department of Labor Notice of Completion (NOC).
 - 11. BABA compliance documentation
 - 12. Other documentation as required by the Authority.
- B. Statement of Adjustment of Accounts – The Authority may require the Contractor to submit a final statement reflecting adjustments to the Contract Price showing:
 - 1. Original Contract Price.
 - 2. Previous Change Orders.

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



CERTIFICATE OF SUBSTANTIAL COMPLETION

Project: Tuluksak Bulk Fuel Upgrades Project	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. Staking Sheets.
 - 4. Addenda.
 - 5. Change Orders and other modifications to the Contract.
 - 6. Reviewed Shop Drawings and product data.
 - 7. Field test records.
 - 8. Inspection certificates.
 - 9. Manufacturer's certificates.
- B. Prior to Substantial Completion, provide original or legible copies of each item maintained by 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.
- 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 RFI's, Shop Drawings or Change Orders, 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 02 32 00
GEOTECHNICAL INVESTIGATIONS

PART 1 - GENERAL

1.1 SOIL REPORTS

A. Existing Geotechnical Conditions:

1. Three test pits near the existing Corporation Tank farm location were conducted with an excavator. No additional soil information is available at the proposed tank farm site. See Appendix B.
2. Contractor is encouraged to visit the site and acquaint themselves with site conditions before submitting a Bid, and the submission of a Bid shall be prima facie evidence that he has done so.
3. Prior to bidding, Contractor may make their own sub-surface investigations, as approved by the project manager and owner, to satisfy himself with site and subsurface conditions.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 02 42 00

REMOVAL AND SALVAGE OF MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

The Contractor shall furnish all labor, material, equipment, and incidentals for all work required to remove, salvage, and transport materials from the proposed and existing tank farm sites and other related tasks described in this Section and as shown on the Drawings. Work under this Section includes:

- A. Prior to beginning demolition work, Contractor shall coordinate an onsite walkthrough with a Corporation & Village Tribe representative to identify and confirm all materials to be salvaged and relocated to a location designated by the Owner.
- B. All materials, equipment, and debris located within the project site, except as specified otherwise or directed by the owner, shall be disposed of by the Contractor and in accordance with applicable federal, state and local regulations.

1.2 RELATED WORK

Related work specified in other sections includes, but is not limited to:

- A. Section 01 11 13 Work Covered by Contract Documents
- B. Section 01 60 13 Materials and Equipment
- C. Section 02 41 16 Structure Demolition
- D. Section 31 11 00 Clearing and Grubbing

1.3 SUBMITTALS

- A. None

1.4 RECEIPT, TRANSPORTING AND STORING OF SALVAGED MATERIALS

- A. The Contractor shall receive, transport, and protect all material identified by the Owner for salvage.
- B. The Contractor shall provide proper equipment as necessary to collect and transport salvaged material. The equipment shall be rated as required to properly handle the material.

1.5 DAMAGE TO SALVAGED MATERIAL

- A. Upon receipt of the materials as specified above, the Contractor shall become solely responsible for their care, transportation, and protection. In the event materials are damaged, lost, stolen, or destroyed by any cause whatsoever, their repair or replacement shall be entirely at the Contractor's expense.
- B. All material replaced by the Contractor shall be equal to the salvaged material.

PART 2 - PRODUCT (NOT USED)

PART 3 – EXECUTION

3.1 SEQUENCE OF WORK

- A. Salvage operations shall be coordinated with temporary access, clearing and grubbing, excavation and fill, and structure demolition work to minimize conflicts.

END OF SECTION

SECTION 02 61 13

EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. The contractor shall not perform any unauthorized excavations. Any contaminated soils exposed as the result of unauthorized excavation shall be stockpiled and dealt with in accordance with this specification at Contractor's expense.
- B. The Contractor is hereby notified that petroleum-contaminated soils may be encountered during excavation required to complete this project.
- C. If the Contractor smells or observes contaminated soils during excavation, they shall immediately notify the Engineer.
- D. The discovery of contaminated soils shall not be cause for Contractor delay of work or equipment/worker standby time claims.
- E. The Contractor will separate contaminated soils from non-contaminated soils using visual/olfactory indicators.
- F. Suspected contaminated soils will be stockpiled on approved liners at a designated area determined by the Contractor and approved by the Owner. Cover suspected contaminated soils in accordance with 18 AAC 75 Section 370.
- G. Owner will dispatch a qualified technician to the site as soon as practical to use a photo-ionization detector (PID) to screen suspected contaminated soils and collect soil samples.
- H. After completing laboratory analysis to verify levels of contamination (if any) the Engineer will coordinate with the Alaska Department of Environmental Conservation (ADEC), Division of Spill Prevention and Response as required.
- I. Any required final remediation of stockpiled contaminated soils will be coordinated with the ADEC.

1.2 RELATED REQUIREMENTS

- A. Not applicable.

1.3 REFERENCES

- A. 18 AAC 75 Article 3 Discharge, Reporting, Cleanup, & Disposal of Oil and other Hazardous Substances.
- B. 18 AAC 75 Section 355 Sampling and Analysis

- C. 18 AAC 75 Section 370 Soil Storage.
- D. ADEC Field Sample Guidance (August 2017)

1.4 ENVIRONMENTAL REQUIREMENTS

- A. All contaminated soil stockpiles must be covered in accordance with 18 AAC 75 Section 370.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All liners must meet 18 AAC Section 370 requirements and must have a minimum 20mil nominal thickness and be rated for hydrocarbon and ultraviolet light exposure. Liners shall be rated for -60° F temperatures.
- B. Personal Protection Equipment must be appropriate for hazardous conditions encountered on the work site and meet requirements in 29 CFR Subpart I, Sections 1910.132- 1910.139.

2.2 LINER SEAMING

- A. Field seaming is prohibited unless specifically approved in writing by the Owner. If field seaming is approved by the Owner, then all seams and joints must be bonded by a technician certified by the liner manufacturer.

PART 3 - EXECUTION

3.1 EXCAVATION AND HANDLING

- A. Appropriate Personal Protection Equipment will be used to protect workers from work site hazards.
- B. All stockpiled soils confirmed by Owners Representative as contaminated shall be contained and covered by the Contractor in accordance with the long-term stockpile requirement of 18 AAC 75 Section 370.
- C. Stockpile location shall be approved in writing by the land owner and by the Owner.

END OF SECTION

SECTION 02 80 10

DECOMMISSION FUEL STORAGE TANKS AND PIPING

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Procedures for Cleaning and Decommissioning Aboveground Fuel Storage Tanks.
- B. Procedures for containing tank contents.
- C. Procedures for Inspecting Aboveground Storage Tanks.

1.2 RELATED REQUIREMENTS

- A. Section 01 11 13 Work Covered by Contract Documents.
- B. Section 01 33 00 Submittals.
- C. Section 02 61 13 Excavation and Handling of Contaminated Material.

1.3 REFERENCES

- A. 18 ACC 75 Article 3 Discharge, Reporting, Cleanup, & Disposal of Oil and other Hazardous Substances.
- B. 18 AAC 75 Section 370 Soil Storage.
- C. API 2015 Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks.
- D. API 653 Tank Inspection, Repair, Alteration, and Reconstruction.
- E. 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response
- F. 40 CFR Chapter I, Subchapter I – Solid Wastes, Parts 260 through 265
- G. 49 CFR Subtitle B, Chapter I, Subchapter A – Hazardous Materials and Oil Transportation, and Subchapter C – Hazardous Material Regulations

1.4 SUBMITTALS

- A. Health and Safety Plan which includes the Work Plan for decommissioning and disposal of fuel storage tanks and piping as required by this Section and Section 01 11 13.
- B. Manifests for disposal of all RCRA and non-RCRA Hazardous Wastes.
- C. Test results from composite testing of the drums of sludge to determine sludge characterization.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. All tank sludge that test hazardous under 40 CFR Part 261 will be contained, stored transported and disposed of in accordance with all Federal, State and local Regulations, Statutes and Laws and the Specifications.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Containment liners and over-pack drums used for this project must withstand 80 mile per hour winds, petroleum emersion, direct sunlight, and -40° F temperatures.

1.7 DECOMMISSIONING AND DISPOSAL REQUIREMENTS

- A. The existing fuel storage tanks identified in the Drawings shall be decommissioned by the Contractor. The Drawings indicate approximate location and owner of the tanks. See also Section 01 11 13 Work Covered by Contract Documents. Relocate decommissioned tanks to an area designated by the Owner. If disposal of the tanks is required by the Contract, the Contractor shall take ownership of the tanks and dispose of them IAW all applicable regulations.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All liners must meet 18 AAC Section 370 requirements.
- B. Over-pack drums for storing tank sludge must meet US DOT and US EPA requirements for transportation.
- C. Personal Protection Equipment must be appropriate for hazardous materials encountered on the work site and meet requirements in 29 CFR Subpart I, Sections 1910.132-1910.139.
- D. Equipment to Monitor Hazardous Atmosphere – The contractor shall use oxygen meters, combustible gas indicators, colorimetric indicator tubes, or organic vapor monitors to determine if a toxic, anoxic, or explosive environment exists.
- E. Contractor shall maintain a site-specific Health and Safety Plan that includes, but is not limited to:
 - 1. List of key personnel.
 - 2. Health and Safety Risk Analysis that meets 29 CFR Subpart I, Section 1910.120(c).
 - 3. Comprehensive Work Plan.
 - 4. Confined Space Entry Plan.

5. Site Control Measures.
6. Health and Safety Training Requirements.
7. Standard Operating Procedures.
8. Emergency Response Procedures.

PART 3 - EXECUTION

3.1 TANK DECOMMISSIONING AND DISPOSAL

- A. The Contractor shall visually inspect all aboveground tanks designated on the Contract Drawings for decommissioning. Contractor shall determine if product exists within each tank. If product exists, Contractor shall pump, filter, and transfer all useable product to the tank owner(s) new tank(s) being constructed to replace the existing ones, or if the tank farm is not complete, to Contractor provided temporary storage. Contractor is responsible for all permits, coordination, and approvals associated with the transfer of fuel. Fuel transfer shall be in accordance with the most current version of the International Fire Code. After all useable product and any accumulated water have been removed, Contractor shall measure the inside diameter of the tank and depth of sludge, if any. From these measurements, the approximate volume of sludge in each tank will be calculated.
- B. The Contractor shall clean the interior of each tank in accordance to API 2015 or other approved method.
- C. If sludge is removed from the tank, the Contractor shall place the sludge in an appropriate container and attach a label that contains the following information:
 1. Container Identification number.
 2. Tank ID#s.
 3. Owner of tank.
 4. Date of Removal.
- D. The consolidation of sludge from tanks containing different products or owned by different entities will not be allowed without prior written approval of both Tank Owners. Should this occur without prior approval, the Contractor shall take immediate ownership of the combined waste and be fully responsible for all cost associated with the manifesting, transport and proper disposal of it.
- E. Appropriate Personal Protection Equipment will be used to protect workers from work site hazards.
- F. All tanks shall be rendered unusable by the Contractor at the time of decommissioning unless instructed by the Owner to salvage.

3.2 PIPE DECOMMISSIONING AND DISPOSAL

- A. All fuel and residual liquid shall be completely removed from existing piping as follows, or by alternate means and method submitted by the Contractor. If alternate means and methods will be used by the Contractor this shall be described in the Work Plan required by this section.
 - 1. Piping 2-inch nominal diameter and smaller: Remove fuel by disconnecting each end of the piping system and blowing fuel out of the pipe with a compressed gas. The velocity of the compressed gas in the pipe shall be sufficient to remove essentially all residual liquid from the pipe.
 - 2. Piping larger than 2-inch nominal diameter: Remove fuel by disconnecting each end of the piping system and propelling a foam pig through the pipeline at a sufficient velocity to remove essentially all remaining liquid. Pig shall be propelled by a compressed gas. At least three (3) pigs shall be propelled through each pipe segment.
- B. The Contractor shall contain, filter and transfer all useable fuel removed from piping to the respective entities tanks. Any unusable fuel or sludge shall be assumed to be hazardous waste and disposed of by the Contractor in accordance with this Specification.
- C. After fuel is removed from the piping, all above grade pipe shall be cut into maximum 10 foot lengths and transported to the Contractor provided final disposal site or other approved location. Below grade piping shall be capped and abandoned in place or removed as required to install new below grade piping.

3.3 HAZARDOUS WASTES

- A. The hazardous nature of containerized sludge will be based upon composite testing performed by the Contractor in accordance with 40 CFR 261.
- B. All waste that is deemed hazardous in accordance with 40 CFR 261 shall be manifested in accordance with 40 CFR 262 and shipped in accordance with US DOT 49 CFR parts 100-199 regulations. The Contractor shall use EPA Uniform Hazardous Waste Manifest, OMB No. 2050-0039, EPA form 8700-22.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture.
- C. Shop Drawings: For steel reinforcement.
- D. Material test reports.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5 and Section 7.
 - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- C. Pre-installation Conference: Conduct conference at Project site.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another

approved material. Provide lumber dressed on at least two edges and one side for tight fit.

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as- drawn steel wire into flat sheets.
- C. Galvanized-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from galvanized steel wire into flat sheets.
- D. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."

2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type IA, II, IIIA.
- B. Aggregates: All aggregates shall be provided from an approved source.
 - 1. Normal-Weight Aggregates: ASTM C 33, graded, 1-inch nominal maximum coarse-aggregate size.
 - 2. Fine Aggregate: ASTM C 33, Free of materials with deleterious reactivity to alkali in cement.
- C. Water: ASTM C 94/C 94M and potable.
- D. Air-Entraining Admixture: ASTM C 260.
- E. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.

2.4 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap polyethylene sheet.
- C. Water: Potable.

2.5 CONCRETE MIXTURES

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
- B. Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 4000 psi at 28 days.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.45.
 - 3. Slump Limit: 4 inches, plus or minus 1 inch.
 - 4. Air Content: 4-7 percent.

2.6 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.7 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork according to ACI 301 to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Chamfer exterior corners and edges of permanently exposed concrete.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.4 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
- C. Cold-Weather Placement: Comply with ACI 306.1.
- D. Hot-Weather Placement: Comply with ACI 301.

3.5 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 1. Apply to concrete surfaces not exposed to public view.

3.6 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screening, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Re-straighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.

3.7 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3.8 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.

3.9 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Contractor will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
 1. Testing Services: Tests shall be performed according to ACI 301 & the Design Drawings.

END OF SECTION

SECTION 05 50 00

STRUCTURAL STEEL & METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes fabrication and erection of structural steel work, as shown on Contract Drawings including schedules, notes, and details showing size and location of members, typical connections, and types of steel required.
 - 1. Structural steel is that work defined in American Institute of Steel Construction (AISC) "Code of Standard Practice" and as otherwise shown on Contract Drawings.
 - 2. This section applies, but is not limited to, stairways, railings, hose reel & dispenser enclosures pump boxes, steel secondary containment, truck fill containment areas, and other miscellaneous steel fabrications.

1.3 SUBMITTALS

- A. Product data or manufacturer's specifications and installation instructions for all products. Include laboratory test reports and other data to show compliance with specifications (including specified standards). No work shall commence on any item until the required submittals have been approved.
- B. Steel Secondary Containment Shop Drawings: The Contractor shall submit Shop Drawings in electronic PDF format showing all principle dimensions of the steel containment structure, details and locations of all accessories and appurtenances, thicknesses of sheets and plates, and details of joints, stairs, cables, connections, and welds.
 - 1. Shop Drawings shall include a description of the protective coating system and a general plan of the structure showing a layout of the containment panels & supports.
 - 2. Complete details, dimensions, and schedules of fabrication and assembly of steel components.
 - 3. Submit product data on all gaskets and sealants confirming proposed products are rated for exposure to design temperatures and fluids contained within the bulk tanks (gasoline & diesel).
 - 4. Shop Drawings shall be stamped and signed by a professional civil engineer demonstrating that the containment design complies with

minimum design criteria for the site.

5. Erection Manuals: Contractor shall submit a PDF copy of field erection manuals illustrating the erection and installation procedures for the steel containment system, liner system and all other appurtenances.
 6. Inspection and Maintenance Instructions: Contractor shall provide PDF copy of operation manuals with written instructions for periodic inspection and maintenance of the containment system.
- C. Shop Drawings: Show fabrication of structural-steel components.
1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 2. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
 3. Complete details, dimensions, and schedules of fabrication and assembly of steel components.

1.4 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code-Steel."
- B. Comply with applicable provisions of the following specifications and documents:
1. AISC's "Code of Standard Practice for Steel Buildings and Bridges."
 2. AISC's "Seismic Provisions for Structural Steel Buildings" and "Supplement No. 2."
 3. AISC's "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design and Load and Resistance Factor Design Specification for Structural Steel Buildings."
 4. AISC's "Specification for the Design of Steel Hollow Structural Sections."
 5. AISC's "Specification for Load and Resistance Factor Design of Single-Angle Members."
 6. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from

erosion and deterioration.

1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
2. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.6 COORDINATION

- A. Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992
- B. Channels, Angles: ASTM A 36
- C. Plate and Bar: ASTM A 36
- D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.
- E. Welding Electrodes: Comply with AWS requirements.

2.2 STEEL SECONDARY CONTAINMENT SYSTEM

- A. Provide pre-engineered rectangular steel containment systems. All components shall be galvanized with 10-gauge (minimum) corrugated containment panels 33" in height. The system shall be designed for zero ground disturbance with no required excavation or driving for installation of support hardware. Designed and manufactured by Dura Life CONTAINMENT Systems – Sioux Steel Company, OAE.
- B. Provide containment dike cross over stairs at the quantity shown in the design drawings. Provide elevation threshold as required to clear containment dike and hand railings meeting OSHA requirements. Fabricate from minimum 14-gauge steel with anti-slip treads. Minimum load rating of 1,000 lbs. Designed and manufactured by Dura Life CONTAINMENT Systems – Sioux Steel Company, OAE.
- C. See specification section GEOTEXTILE FABRICS for containment liner and geotextile protective layer specifications.

2.3 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex

steel structural bolts; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.

1. Finish: Galvanized.

B. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20, ASTM A 780.

2.4 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC's "Specification for Structural Steel Buildings-- Allowable Stress Design and Plastic Design and Load and Resistance Factor Design Specification for Structural Steel Buildings."

1. Identify high-strength structural steel according to ASTM A6 and maintain markings until structural steel has been erected.

2. Mark and match-mark materials for field assembly.

B. Architecturally Exposed Structural Steel: Comply with fabrication requirements, including tolerance limits, of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel identified as architecturally exposed structural steel.

1. Fabricate with exposed surfaces smooth, square, and free of surface blemishes including pitting, rust, scale, and roughness.

2. Remove blemishes by filling or grinding or by welding and grinding, before cleaning, and treating.

C. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.

D. Bolt Holes: Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.

E. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

F. Cleaning: Clean and prepare steel surfaces according to either:

1. Caustic cleaning and cleaning according to SSPC-SP8, or

2. Cleaning according to SSPC-SP1 and SSPC-SP6

G. Welded Door Frames: Build up welded door frames attached to structural steel. Weld exposed joints continuously and grind smooth. Plug-weld fixed steel bar stops to frames. Secure removable stops to frames with countersunk, cross-recessed head machine screws, uniformly spaced not more than 10 inches o.c., unless otherwise indicated.

H. Holes: Provide holes required for securing other work to structural steel and for passage of other work through steel framing members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Base-Plate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.5 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.
 1. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
 2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
 3. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent weld show-through on exposed steel surfaces.
 - a. Grind butt welds flush.
 - b. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds.

2.6 STEEL COATING

- A. Hot-Dip Galvanized Finish: Galvanize in accordance with ASTM A123, G90. This includes, but is not limited to the following: grip strut; bar grate; pipe supports, clamps, hardware; gate and fence components; ladders; and catwalks.
 1. Finish all cut ends, field welds and damaged surfaces of galvanized and zinc plated supports and fasteners with spray on cold galvanizing compound, ZRC, or approved equal.
- B. Coat Tanks IAW Section 33 56 13 Aboveground Fuel Storage Tanks.
- C. Coat Piping IAW Section 33 52 13 Liquid Fuel Piping.

2.7 SOURCE QUALITY CONTROL

- A. General: Materials and fabrication procedures are subject to inspection and tests in mill, shop, and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.
 - 1. At Contractor's expense, promptly remove and replace materials or fabricated components that do not comply.
- B. Design of Members and Connections: Details shown are typical; similar details apply to similar conditions, unless otherwise indicated. Verify dimensions at site whenever possible without causing delay in the work.
 - 1. Promptly notify Project Manager whenever design of members and connections for any portion of structure are not clearly indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify elevations of concrete-bearing surfaces and locations of bearing plates, and other embedments, with steel erector present, for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place, unless otherwise indicated.

3.3 ERECTION

- A. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.
- B. Field Assembly: Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces that will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
- C. Level and plumb individual members of structure within specified AISC tolerances.
- D. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary

members that are not under stress, as acceptable to Project Manager. Finish gas-cut sections equal to a sheared appearance when permitted.

- E. Touch-Up Repairs: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint or galvanizing.
 - 1. Galvanizing Repair: Galvanized coating at damaged areas shall be repaired according to ASTM A 780 (Annex A1) using zinc-based alloy repair sticks commonly known as "hot sticks".
 - 2. Coating Repair: If underlying metal surface is exposed, wheel abrade or sandblast to clean metal and re-coat same as tanks. If damage does not fully penetrate coating then reapply top coat only to minimum DFT.

3.2 QUALITY CONTROL

- A. Authority will engage an independent testing and inspection agency to inspect welded connections and to perform tests and prepare test reports.
- B. Testing agency shall conduct and interpret tests, state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.
- C. Provide access for testing agency to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.
- D. Testing agency may inspect structural steel at plant before shipment.
- E. Correct deficiencies in structural steel work that inspection and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense, as necessary to reconfirm any noncompliance of original work and to show compliance of corrected work.
- F. Shop Welding: Inspect and test during fabrication of structural steel assemblies, as follows:
 - 1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
 - 2. Perform visual inspection of all welds.
 - 3. Perform tests of full penetration welds as follows.
 - a. Ultrasonic Inspection: ASTM E 164.
- G. Field Welding: Inspect and test during erection of structural steel as follows:
 - 1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
 - 2. Perform visual inspection of all welds.

3. Perform tests of full penetration welds as follows:
 - a. Ultrasonic Inspection: ASTM E 164.

END OF SECTION

SECTION 05 53 00

METAL GRATINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Metal bar gratings.
 - 2. Formed-metal plank gratings.
 - 3. Metal frames and supports for gratings.
 - 4. Metal bar grating stair treads.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance of Gratings: Provide gratings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Floors: Uniform load of 100lbf/sq. ft. or concentrated load of 2000 lbf, whichever produces the greater stress.
 - 2. Walkways and Elevated Platforms: Uniform load of 100 lbf/sq. ft.
 - 3. Sidewalks and Vehicular Driveways: Uniform load of 250 lbf/sq. ft. or concentrated load of 8000 lbf, whichever produces the greater stress.
 - 4. Stair Treads: Uniform load of 100 lbf/sq. ft. or concentrated load of 300 lbf.
- B. Seismic Performance: Provide gratings capable of withstanding the effects of earthquake motions determined according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 9, "Earthquake Loads" and shown in structural construction documents.

1.3 SUBMITTALS

- A. Product Data: For the following:
 - 1. Metal bar gratings.
 - 2. Formed-metal plank gratings.
 - 3. Clips and anchorage devices for gratings.
 - 4. Paint products.

- B. Shop Drawings: Detail fabrication and installation of gratings.

1.4 QUALITY ASSURANCE

- A. Metal Bar Grating Standards: Comply with NAAMM MBG 531, "Metal Bar Grating Manual" and NAAMM MBG 532, "Heavy-Duty Metal Bar Grating Manual."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Metal Bar Gratings:
 - a. Alabama Metal Industries Corporation.
 - b. All American Grating, Inc.
 - c. Barnett/Bates Corp.
 - d. Borden Metal Products (Canada) Limited.
 - e. Fisher & Ludlow.
 - f. Grupo Metelmex, S.A. de C.V.
 - g. IKG Industries; a Harsco Company.
 - h. Marwas Steel Co.; Laurel Steel Products Division.
 - i. Ohio Gratings, Inc.
 - j. Seidelhuber Metal Products, Inc.
 - k. Tru-Weld.
 - l. Or Approved Equivalent Product.

2.02 METALS

- A. Ferrous Metals:
 1. Steel Plates, Shapes, and Bars: ASTM A 36.
 2. Wire Rod for Grating Crossbars: ASTM A 510.
 3. Uncoated Steel Sheet: ASTM A 1011, structural steel, Grade 30.
 4. Galvanized Steel Sheet: ASTM A 653, structural quality, Grade 33, with G90 coating.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

2.4 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

2.5 FABRICATION

- A. Cut, drill, and punch material cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
- B. Form from materials of size, thickness, and shapes indicated, but not less than that needed to support indicated loads.
- C. Fit exposed connections accurately together to form hairline joints.
- D. Fabricate toeplates for attaching in the field.

2.6 METAL BAR GRATINGS

- A. Welded Steel Grating:
 - 1. Bearing Bar Spacing: 2"inch max (1/2" clear, max) o.c.
 - 2. Bearing Bar Depth: 1-1/4 inches.
 - 3. Bearing Bar Thickness: 3/16 inch.
 - 4. Crossbar Spacing: 4 inches o.c.
 - 5. Traffic Surface: **Serrated.**
 - 6. Steel Finish: Hot-dip galvanized with a coating weight of not less than 1.8 oz./sq. ft. of coated surface.
- B. Removable Grating Sections: Fabricate with banding bars attached by welding to entire perimeter of each section. Include anchors and fasteners of type indicated or, if not indicated, as recommended by manufacturer for attaching to supports.
- C. Fabricate cutouts in grating sections for penetrations indicated. Edge-band openings in grating that interrupt four or more bearing bars with bars of same size and material as bearing bars.
- D. Do not notch bearing bars at supports to maintain elevation.

2.7 GRATING FRAMES AND SUPPORTS

- A. Frames and Supports for Metal Gratings: Fabricate from metal shapes, plates, and bars of welded construction to sizes, shapes, and profiles indicated and as necessary to receive gratings. Grating may be supported on treated timbers where indicated in the Design Drawings. Miter and weld connections for perimeter angle frames. Cut, drill, and tap units to receive

hardware and similar items.

1. Unless otherwise indicated, fabricate from same basic metal as gratings.
- B. Galvanize steel frames and supports at all locations.

2.8 STEEL FINISHES

- A. Finish gratings, frames, and supports after assembly.
- B. Galvanizing: Apply zinc coating by the hot-dip process complying with ASTM A 123.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Perform cutting, drilling, and fitting required for installing gratings. Set units accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
- B. Fit exposed connections accurately together to form hairline joints.
1. Weld connections that are not to be left as exposed joints but cannot be shop welded. Do not weld, cut, or abrade the surfaces of units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Attach toeplates to gratings by welding at locations indicated.
- D. Metal Bar Gratings: Comply with recommendations of referenced metal bar grating standards, including installation clearances and standard anchoring details.
1. Attach removable units to supporting members with type and size of clips and fasteners indicated or, if not indicated, as recommended by grating manufacturer for type of installation conditions shown.
 2. Attach nonremovable units to supporting members by welding where both materials are same; otherwise, fasten by bolting as indicated above.
- E. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Framing with dimension lumber.
 - 2. Framing with engineered wood products.
 - 3. Wood blocking and nailers.
 - 4. Wood furring.
 - 5. Wood sleepers.
 - 6. Plywood backing panels.
- B. Related Sections include the following:
 - 1. Division 06 Section "Sheathing."
 - 2. Division 06 Section "Timber Construction"

1.3 DEFINITIONS

- A. Exposed Framing: Framing not concealed by other construction.
- B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.
- C. Timber: Lumber of 5 inches nominal or greater in least dimension.
- D. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 - 1. NeLMA: Northeastern Lumber Manufacturers' Association.
 - 2. RIS: Redwood Inspection Service.
 - 3. SPIB: The Southern Pine Inspection Bureau.

4. WCLIB: West Coast Lumber Inspection Bureau.
5. WWPA: Western Wood Products Association.

1.4 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
- B. Fastener Patterns: Full-size templates for fasteners in exposed framing.
- C. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- D. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
 1. Wood-preservative-treated wood.
 2. Power-driven fasteners.
 3. Powder-actuated fasteners.
 4. Metal framing anchors.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of

Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
4. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPA C2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).
 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
 1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.
- D. Application: Treat lumber as indicated on Drawings and the following:
 1. All, exposed framing, wood cants, nailers, curbs, equipment support bases, blocking, pipe supports, stripping, wood sills, foundations, sleepers, blocking, furring, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 2. Treat all dimensional lumber unless approved in writing by Owner.

2.3 DIMENSION LUMBER FRAMING

- A. Maximum Moisture Content: 19 percent
- B. Non-Load-Bearing Interior Partitions: Construction or No. 2 of any of the following species:
 1. Hem-fir.

- C. Joists, Rafters, and Other Framing Not Listed Above: No. 2 grade and any of the following species:
 - 1. Hem-fir.
- D. Joists, Rafters, and Other Framing Not Listed Above: Any species of machine stress-rated dimension lumber with a grade of not less than 2400F-2.0E
- E. Joists, Rafters, and Other Framing Not Listed Above: Any species and grade with a modulus of elasticity of at least 1,500,000 psi and an extreme fiber stress in bending of at least 850 psi for 2-inch nominal thickness and 12-inch nominal width for single-member use.

2.4 TIMBER FRAMING

- A. See Section 06 13 00 Timber Construction.

2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Rooftop equipment bases and support curbs.
 - 4. Cants.
 - 5. Furring.
 - 6. Grounds.
 - 7. Utility shelving.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any species.
- C. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content and any of the following species:
 - 1. Hem-fir.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.6 PLYWOOD BACKING PANELS

- A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C- D Plugged, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1.
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

2.8 METAL FRAMING ANCHORS

- A. Basis-of-Design Products: Subject to compliance with requirements, provide products indicated on Drawings or comparable products by one of the following:
 - 1. Simpson Strong-Tie Co., Inc.
 - 2. USP Structural Connectors.
- B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer that meet or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- C. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G60 coating designation.
 - 1. Use for interior locations where stainless steel is not indicated.
- D. Stainless-Steel Sheet: ASTM A 666, Type 316.
 - 1. Use for exterior locations and where indicated.

- E. Joist Hangers: U-shaped joist hangers with 2-inch- long seat and 1-1/4-inch- wide nailing flanges at least 85 percent of joist depth.
 - 1. Thickness: 0.062 inch.
- F. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.
 - 1. Strap Width: 2 inches.
 - 2. Thickness: 0.062 inch.
- G. Bridging: Rigid, V-section, nailless type, 0.050 inch thick, length to suit joist size and spacing.
- H. Post Bases: Adjustable-socket type for bolting in place with standoff plate to raise post 1 inch above base and with 2-inch- minimum side cover, socket 0.062 inch thick, and standoff and adjustment plates 0.108 inch thick.
- I. Joist Ties: Flat straps, with holes for fasteners, for tying joists together over supports.
 - 1. Width: 1-1/4 inches.
 - 2. Thickness: 0.062 inch.
 - 3. Length: 24 inches minimum and as indicated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- D. Metal Framing Anchors: Install metal framing to comply with manufacturer's written instructions.
- E. Do not splice structural members between supports, unless otherwise indicated.
- F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

- G. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- H. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- I. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 - 3. Table 23-II-B-1, "Nailing Schedule," and Table 23-II-B-2, "Wood Structural Panel Roof Sheathing Nailing Schedule," in ICBO's Uniform Building Code.
- J. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.
- K. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
 - 1. Comply with indicated fastener patterns where applicable.
 - 2. Use finishing nails, unless otherwise indicated.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.
- C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to

bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 TIMBER FRAMING INSTALLATION

- A. Install timber with crown edge up and provide not less than 4 inches of bearing on supports. Provide continuous members, unless otherwise indicated; tie together over supports as indicated if not continuous.
- B. Install wood posts using metal anchors indicated.
- C. Treat ends of timber beams and posts exposed to weather by dipping in water-repellent preservative for 15 minutes.

3.4 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

SECTION 06 13 00

TIMBER CONSTRUCTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section applies to construction using timbers including, but not limited to, above ground pipe supports, tank supports, and timber foundation systems where shown on the drawings.

Related Sections include the following:

- 1. Division 06 Section "Sheathing" & "Rough Carpentry"

1.3 DEFINITIONS

- A. Timbers: Lumber of 5 inches nominal or greater in least dimension.
- B. Inspection agencies, and the abbreviations used to reference them, include the following:
 - 1. NELMA - Northeastern Lumber Manufacturers Association.
 - 2. NLGA - National Lumber Grades Authority.
 - 3. WCLIB - West Coast Lumber Inspection Bureau.
 - 4. WWPA - Western Wood Products Association.

1.4 SUBMITTALS

- A. Product Data: For each type of process indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Fastener Patterns: Full-size templates for fasteners in exposed framing.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Schedule delivery of heavy timber construction to avoid extended on-site storage and to avoid delaying the Work.

B. Store materials under cover and protected from weather and contact with damp or wet surfaces. Provide for air circulation within and around stacks and under temporary coverings.

PART 2 - PRODUCTS

2.1 TIMBER, GENERAL

A. A. General: Comply with DOC PS 20 and grading rules of lumber grading agencies certified by American Lumber Standards Committee Board of Review, as applicable.

1. Factory mark each item of timber with grade stamp of grading agency.

2. Provide dressed lumber, S4S, unless otherwise indicated.

B. Preservative Treatment:

1. Pressure treatment in accordance with AWPA standard C22, 0.60 minimum retention, rated for ground contact.

2. Preservative Chemicals: Acceptable to authorities having jurisdiction and one of the following:

- a. Copper Naphthenate

- b. Chromated Copper Arsenate (CCA)

- c. Ammoniacal copper zinc arsenate (ACZA).

3. Use process that includes water-repellent treatment.

4. **Application: Treat all timber construction, unless otherwise indicated.**

C. Timber Species and Grade: Hem-fir or hem-fir (North); No. 2 or better, NLGA, WCLIB, or WWPA.

2.2 TIMBER CONNECTORS

- A. Fabricate tie rods from galvanized round steel bars with upset threads connected with forged-steel turnbuckles complying with ASTM A 668/A 668M.
- B. Fasteners: Stainless steel fasteners shall be provided for connections in all pressure-treated wood, unless the following requirements are met:
 - 1. Approval letters are submitted from both the wood treatment manufacturer and the fastener manufacturer, stating the proposed fasteners are suitable for permanent installations in exterior, exposed, wet locations.
 - 2. Steel fasteners, if approved shall be as a minimum ASTM A307 lags or bolts with a triple plate galvanized finish of an equivalent thickness to G185.
- C. Seal Coat: After fabricating and surfacing each unit, apply a saturation coat of penetrating sealer on surfaces of each unit except for treated wood where the treatment included a water repellent. Galvanized fasteners and assemblies do NOT require seal coating.

2.3 WOOD PRESERVATIVE

- A. Chemical solution for the treatment of field cuts and bore holes in accordance with the requirements of AWWA standard M4.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Erect heavy timber construction true and plumb. Provide temporary bracing to maintain lines and levels until permanent supporting members are in place.
- B. Fit members by cutting and restoring exposed surfaces to match specified surfacing. Pre-drill for fasteners and assembly of units.
- C. Install timber connectors as indicated.
 - 1. Unless otherwise indicated, install lag bolts with same orientation within each connection and in similar connections.
 - 2. Pre-drill lead holes for lag screws:
 - a. The clearance hole for the shank shall have the same diameter as the shank, and the same depth of penetration as the length of unthreaded shank. Shank clearance hole shall be increased as required for countersinking.

- b. The lead hole for the threaded portion shall have a diameter equal to 40% to 70% of the shank diameter and a length equal to at least the length of the threaded portion.
 - c. The threaded portion of the lag screw shall be inserted in its lead hole by turning with a wrench, not by driving with a hammer.
 - d. Soap or other lubricant shall be used on the lag screws or in the lead holes to facilitate insertion and prevent damage to the lag screw.
- D. Field treat all cuts and bore holes in accordance with AWPA standard M4.

3.2 ADJUSTING AND CLEANING

- A. Repair damaged surfaces and finishes after completing erection. Replace damaged heavy timber construction if repairs are not approved by Project Manager.

END OF SECTION

SECTION 06 16 00

SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Wall sheathing.
 - 2. Roof sheathing.
 - 3. Subflooring.
 - 4. Underlayment.
 - 5. Building paper.
 - 6. Building wrap.
 - 7. Sheathing joint-and-penetration treatment.
 - 8. Flexible flashing at openings in sheathing.
- B. Related Sections include the following:
 - 1. Division 06 Section "Rough Carpentry" for plywood backing panels.

1.3 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
 4. For building wrap, include data on air-/moisture-infiltration protection based on testing according to referenced standards.
- B. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
1. Preservative-treated plywood.
 2. Building wrap.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Stack plywood and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PANEL PRODUCTS, GENERAL

- A. Plywood: DOC PS 1.
- B. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- C. Factory mark panels to indicate compliance with applicable standard.

2.2 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWPA C9.
1. Preservative Chemicals: Acceptable to authorities having jurisdiction.
- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: Treat items indicated on Drawings and plywood in contact with the ground, roofing, flashing, vapor barriers, and waterproofing. Treat all exterior plywood unless an alternate coating system is indicated.

2.3 WALL SHEATHING

- A. Wall Sheathing: Grade CD interior-APA with exterior glue for the size and span rating shown on the drawings.

2.4 FLOOR SHEATHING

- A. Plywood Floor Sheathing: APA rated Sturd-I-Floor, meeting requirements of

Doc PS1 for the sizes and span rating shown on the drawings.

2.5 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
 - 1. For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."
 - 3. Table 23-II-B-1, "Nailing Schedule," and Table 23-II-B-2, "Wood Structural Panel Roof Sheathing Nailing Schedule," in ICBO's "Uniform Building Code."
- D. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30S, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Combination Subfloor-Underlayment:
 - a. Glue and nail to wood framing.
 - b. Space panels 1/8 inch apart at edges and ends.

 - 2. Subflooring:
 - a. Glue and nail to wood framing.
 - b. Space panels 1/8 inch apart at edges and ends.

 - 3. Wall and Roof Sheathing:
 - a. Nail to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.
 - b. Space panels 1/8 inch apart at edges and ends.

END OF SECTION

SECTION 10 14 00

SIGNS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. This section covers the furnishing and installation of signs at the bulk tank farms, fenced area, bulk transfer area, dispenser, and marine header.
- B. The Contractor shall furnish all signs and fasteners.

1.2 RELATED REQUIREMENTS

- A. Section 01 33 00 Submittals.
- B. Section 32 31 13 Chain Link Fences and Gates.

1.3 REFERENCES

- A. International Fire Code (IFC), Section 3404.
- B. National Fire Protection Association, No. 704.
- C. State of Alaska, Department of Transportation, "Standard Specification for Highway Construction" and "Standard Drawings Manual".

1.4 SUBMITTALS

- A. Submit shop drawings of all signs, including height and width as well as sign thickness. Indicate background color and text color, text information (i.e. height and stroke) proposed for each sign.
- B. Submit manufacturer's data and standard colors for vinyl backgrounds and letters.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Signs shall be constructed of 0.08" minimum aluminum plate with either red reflective or black letters on a white non-reflective background, unless otherwise indicated.
- B. Size signs and lay out letters such that no letters touch or overlap, and all words are clearly readable.
- C. Size letters as indicated on the Contract Drawings and adjust size of sign accordingly or make sign the dimensions indicated and size text appropriately to fit within the available space.

- D. Provide 3M series 255 High Performance vinyl letters on 3M 3650-10 white vinyl background, or Gerber thermal transfer film printed letters on Gerber High Performance vinyl background as indicated on the Drawings, or as appropriate for the application.

2.2 SIGNS

- A. Provide signs as indicated on the Contract Drawings.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install in accordance with IFC flammable and combustible liquid signage standards, and NFPA.
- B. Signs shall be conspicuously mounted and easily read.
- C. Where signs are fastened to fences, the fasteners used shall be galvanized steel hog rings or wire ties.

END OF SECTION

SECTION 11 95 13

SPILL RESPONSE EQUIPMENT

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. This section includes spill response equipment for the Co-located bulk fuel facilities.
- B. Spill response equipment storage is in Contractor provided connexes overpack drums and available storage space within Owner facilities. Coordinate with Facility Owner(s) to store and organize spill response equipment.

1.2 REFERENCES

- A. United States Department of Labor, Occupational Safety and Health Administration (OSHA):
 - 1. 29 Code of Federal Regulations (CFR) 1910

1.3 SUBMITTALS

- A. Submit under provisions of Division 01.
- B. Submit manufacturer's data for all spill response equipment and supplier for each item. Group item by each supplier.
- C. Unless otherwise indicated alternate manufacturers will be acceptable as long as they supply similar equipment with the same quality and performance.
- D. All equipment and materials shall be new unless indicated otherwise.

1.4 GENERAL

- A. Contractor is responsible for providing spill response equipment as specified and in accordance with this Section.
- B. The co-located Spill Response Connexes shall be placed on timber foundations in the locations shown on the drawings (verify final location with engineer prior to placement). Provide six (6) 8-inch x 8-inch x 10 foot pressure treated timbers equally spaced below each connex.
 - 1. Place all spill response equipment, including overpack drums, inside contractor provided Connex.
 - 2. Place and organize all spill response equipment as directed by the Owner.
 - 3. Contractor shall provide and install four steel shelving units approximately 6'x6'x30" to each facility operator as required to adequately store, organize and support the specified spill equipment, extra facility parts and associated facility tools.

PART 2 - PRODUCTS

2.1 SPILL RESPONSE EQUIPMENT

- A. Provide all spill response equipment as specified in this section or as noted on the Contract Drawings.
- B. Contractor provided spill response Connex shall be standard 20-foot-long shipping containers, steel construction, not insulated. Connexes shall be in like new condition but need not be new. Connex doors shall operate freely without binding or excessive resistance, and connex exterior shall have minimal rust. Any rust shall be wire wheeled to clean metal, primed and painted.
- C. **Provide two sets of the following equipment and materials. One for the Corporation and the other for the City.**

Quantity	Item/Description
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Absorbent Material and Containers

5 EA	Overpack Drums, 95 Gallon Poly
1 EA	Open-top Drum, 55 Gallon, Metal
2 EA	Absorbent Roll, min. 30"x140', min. absorb 50 gal/bale
2 EA	Absorbent Pads, min. 16"x20", 100 Pieces Ea, min. absorb 24
6 EA	Absorbent Boom, min. 6" x 40', min. 100 gal/40'
2 EA	Absorbent Sweep, 19" x 100', min absorb 25 gal/bale

Personnel Protective Equipment

4 Pair	Gloves, Nitrile AF18 Chem-Resist, Pairs
4 EA	Tyvek Suits, XL Polyethylene Coated, zipped front, elastic wrist and
4 EA	Goggles, UVEX Futura
4 EA	Hardhats, Bullard Traditional, with 6-point ratchet suspension, orange

Recovery Equipment

2 EA	3500 gallon Fold-A-Tank
1 EA	2-inch portable centrifugal pump, gas-powered Gorman Rupp #82D1-8-X rated at 160 gpm with 2" camlocks. Pre-Approved Alternates: (Option #1: Marlow 2AM32-P rated at 140 gpm with 2" camlocks) (Option #2: Homelite #320 rated at 140 gpm with 2" camlocks)
1 EA	Discharge Hose with 2" camlocks, 100' total length
1 EA	Suction Hose with 2" camlocks, 50' total length
2 EA	Shovel, square point, wood handle
2 EA	Rake, 16-tine forged bow, wood handle
2 Roll	Garbage/Disposal Bags, heavy duty, 100ct./roll, 33-gal., 4-mil, printed "Oily Waste"

Miscellaneous

1 EA	Smart Ash Incinerator
--	Fire Extinguishers, Portable, Type 4A-80BC (See Drawings for quantity)
1 EA	8x20 connex, lockable
4 EA	6'x6'x30" steel shelving units

AS REQD	Padlocks, keyed-alike (for each gate, enclosure, etc. plus 2 spares)
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PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

SECTION 26 01 26 - MAINTENANCE TESTING OF ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Feeder Megohm Testing.
- B. Receptacle Branch Circuit Testing.
- C. Ground Fault Circuit Interrupter Testing.
- D. Electrical Service Ground Testing.

1.2 REFERENCES

- A. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- B. ANSI/IEEE Std 81-1983 Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System.
- C. ANSI/TIA/EIA - 568-B.1 and Addendums, General Cabling System Requirements.

1.3 SUBMITTALS

- A. Submit data under provisions of Division 01 and Section 26 05 00.
- B. Product Data: Submit technical information for each test instrument to include manufacturer, model number, serial number, ratings, accuracy, and National Institute of Standards and Technology (NIST) Traceable calibration certification.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit Test Reports per Section 26 05 00.

1.5 COORDINATION

- A. Provide written 72 hours advance notice of all tests to be performed to allow Owner's Representative to witness testing.

1.6 REQUIRED TEST INSTRUMENTS

- A. MEGOHMMETER.
 - 1. Product Description: 1000 Volt DC, portable, insulation and resistance test Megohmmeter.
 - 2. Equipment Accuracy:

- a. 2000 Megohm Range - 3% of full Scale.

B. BRANCH CIRCUIT ANALYZER

1. Product Description: Branch circuit analyzer capable of receptacle testing of voltage drop under load, hot-neutral-ground conductor resistances, common mode (N-G) Voltage, and GFCI trip point.
2. Manufacturer: Ideal SureTest. Model: 61-156 ST-1THD Wiring/Harmonic Distortion Analyzer or approved equal.
3. Equipment Accuracy:
 - a. Accuracy 1% full scale \pm 1 digit True RMS.

C. GROUND RESISTANCE CLAMP-ON METER

1. Product Description: Digital, direct reading clamp-on resistance ground tester.
2. Manufacturer: AEMC. Model: 3711 or approved equal.
3. Equipment Accuracy:
 - a. 1.0 to 50.0 Ohms \pm (1.5% + 0.1 Ohm).
 - b. 50.0 to 100.0 Ohms \pm (2.0% + 0.1 Ohm).
 - c. 100 to 200 \pm (1.5% + 0.1 Ohm).
 - d. 200 to 400 Ohms \pm (1.5% + 0.1 Ohm).
 - e. 400 to 600 Ohms \pm (1.5% + 0.1 Ohm).

D. MULTIMETER

1. Product Description: Digital True RMS Multimeter.
2. Equipment Accuracy:
 - a. AC Voltage Range: 0.75% \pm 3 last single digits at 60 Hz.
 - b. AC Current Range: 0.90% \pm 3 last single digits at 60 Hz.
 - c. DC Voltage Range: 0.25% \pm 1 last single digit.
 - d. DC Current Range: 0.75% \pm 1 last single digit.
 - e. Resistance Ranges: 0.50% \pm 1 last single digit.
 - f. Frequency Range: 0.10% \pm 1 last single digit @ 60 Hz.

1.7 TEST INSTRUMENT CALIBRATION

- A. All test equipment shall be in good mechanical and electrical condition.
- B. Provide calibration for each test instrument directly traceable to the National Institute of Standards and Technology (NIST) of higher accuracy than that of the instrument tested.
- C. Provide calibration labels visible on all test equipment. Records, which show date and results of instruments calibrated or tested, shall be kept up-to-date.
- D. Calibrate instruments in accordance with the following frequency schedule:
 - 1. Field instruments: 12 months maximum.
 - 2. Up-to-date instrument calibration instructions and procedures shall be maintained for each test instrument with the equipment.

1.8 MINIMUM REPORT INFORMATION

- A. Report Criteria: After each test, promptly submit one copy of report to the Owner's Representative.
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Name and Model of Tester and witnesses.
 - 4. Date and time of sampling or inspection.
 - 5. Identification of product and specifications section.
 - 6. Type of inspection or test.
 - 7. Date of test.
 - 8. Results of tests.
 - 9. Indicate compliance or non-compliance with Contract Documents.
 - 10. Final adjustment setting values where applicable.
- B. Submit copy of all tests performed in the O&M manual.

1.9 GENERAL REQUIREMENTS

- A. Submit test results within 3 working days of each test and included in the O&M manual.
- B. Provide qualified personnel at site to perform all testing.

- C. Perform specified testing of products in accordance with specified standards or as denoted in this specification whichever is more stringent.
- D. Promptly notify Owner's Representative or Engineer of irregularities or non-conformance of Work or products.
- E. Perform additional tests when test is performed incorrectly, deemed inaccurate, or incorrectly documented.
- F. The Contractor shall provide all forms, instrumentation and test equipment, loads, and other consumables required to demonstrate the systems to Owner's Representative satisfaction.
- G. Perform and submit all testing prior to substantial completion and system acceptance.
- H. Reset all material, cables etc. that are disturbed after testing.
- I. Replace and retest all material installed which does not meet or exceed the minimum acceptable limits set forth in this specification in accordance with the contract original requirements at no additional charge to Contract Sum/Price.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 FEEDER CONDUCTOR TEST

- A. Test Criteria:
 - 1. Use Megohmmeter to test all conductors sized #6 AWG and larger.
 - 2. Perform insulation-resistance test on each conductor with respect to ground and adjacent conductors. Applied potential 1000 volts DC for 600 volt rated cable.
 - 3. Perform test immediately after installation.
 - 4. Clean exposed cable ends with clean cloth and alcohol.
 - 5. Disconnect conductors from all equipment.
 - 6. Test duration shall be one minute.
 - 7. Record the resistance of the insulated conductor under test with all other conductors connected together and to ground (metallic raceway, grounding conductor, etc).
 - 8. Perform continuity test to verify correct cable connection.
 - a. Submit test results to Owner's Representative and Engineer.

B. Test Values:

1. Minimum insulation-resistance value: 50 megohms.
2. Investigate all deviations between adjacent phases and repeat test as necessary. Any deviations that are uncorrectable shall be reported to Owner's Representative and Engineer. Replace all conductors with uncorrectable deviations.

3.2 RECEPTACLE GROUND FAULT CIRCUIT INTERRUPTER TEST

A. Test Criteria:

1. Use Branch Circuit Analyzer to perform test of each GFCI protected receptacle.
2. Record trip level in mA for each receptacle tested.
3. Submit test results to Owner's Representative and Engineer.

B. Test Values:

1. Trip Range: Between 4-6 mA.

3.3 ELECTRICAL SERVICE GROUND TEST

A. Test Criteria:

1. Use ground resistance clamp-on meter to measure the resistance of service ground with meter clamped between system neutral bond and each grounding electrode. Perform this test on new or existing services and all separately derived systems.
2. Record resistance value in ohms.
3. Submit test results to Owner's Representative and Engineer.

B. Test Values:

1. Maximum ground resistance: 10 ohms.

END OF SECTION

SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. General Requirements specifically applicable to Division 26, in addition to Division 01 provisions.
- B. The electrical system equipment and installation shall comply with all provisions and requirements of this specification, as well as any and all applicable national, state and local codes and standards.

1.2 WORK SEQUENCE

- A. Construct Work in sequence under provisions of Division 01.

1.3 COORDINATION

- A. Coordinate the Work specified in this Division under provisions of Division 01.
- B. Prepare drawings showing proposed rearrangement of Work to meet job conditions, including changes to Work specified under other Sections. Obtain permission of Architect prior to proceeding.

1.4 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code, latest adopted edition including all state and local amendments.
- B. ANSI/NECA NEIS – National Electrical Installation Standards.
- C. ANSI/NETA ATS – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- D. ANSI/IEEE C2 - National Electrical Safety Code latest adopted edition.
- E. Electrical Reference Symbols: The Electrical "Legend" on drawings is standardized version for this project. All symbols shown may not be used on drawings. Use legend as reference for symbols used on plans.
- F. Electrical Drawings: Drawings are diagrammatic; complimentary to the Civil Drawings; not intended to show all features of work. Install material not dimensioned on drawings in a manner to provide a symmetrical appearance. Do not scale drawings for exact equipment locations. Review Civil Drawings and adjust work to conform to conditions shown thereon. Field verification of dimensions, locations and levels is directed.

1.5 REGULATORY REQUIREMENTS

- A. Conform to ANSI/NFPA 70.

- B. Conform to ANSI/IEEE C2.
- C. Obtain electrical permits, plan review, and inspections from authority having jurisdiction.

1.6 SUBMITTALS

- A. Submittal review is for general design and arrangement only and does not relieve the Contractor from any requirements of Contract Documents. Submittal not checked for quantity, dimension, fit or proper operation. Where deviations of substitute product or system performance have not been specifically noted in the submittal by the Contractor, provisions of a complete and satisfactory working installation is the sole responsibility of the Contractor.
- B. In addition to requirements referenced in Division 01, the following is required for work provided under this division of the specification.
 - 1. Provide material and equipment submittals containing complete listings of material and equipment shown on Electrical Drawings and specified herein. Separate from work furnished under other divisions.
 - 2. Submittals shall be provided in PDF format with each section indexed in the PDF document. **Submittals for Division 26 shall be complete and submitted at one time.** Unless given prior approval, partial submittals will be returned unreviewed.
 - 3. Clearly identify all material and equipment by item, name or designation used on drawings and in specifications.
 - 4. **Submit only pages which are pertinent;** mark catalog sheets to identify pertinent products, referenced to Specification Section and Article number. Show reference standards, performance characteristics, and capacities; wiring diagrams and controls; component parts; finishes; dimensions; and required clearances.
 - 5. 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.
 - 6. Review submittals prior to transmittal; determine and verify field measurements, field construction criteria, manufacturer's catalog numbers, and conformance of submittal with requirements of Contract Documents.
 - 7. Coordinate submittals with requirements of work and of Contract Documents.
 - 8. Certify in writing that the submitted shop drawings and product data are in compliance with requirements of Contract Documents. Notify Architect/Engineer in writing at time of submittal, of any deviations from requirements of Contract Documents.
 - 9. Do not fabricate products or begin work which requires submittals until return of submittal with acceptance from Engineer.

10. Equipment scheduled by manufacturer's name and catalog designations, manufacturer's published data and/or specification for that item, in effect on bid date, are considered part of this specification. Approval of other manufacturer's item proposed is contingent upon compliance therewith.

1.7 SUBSTITUTIONS

- A. In accordance with the General Conditions and the General Requirements, Substitution and Product Options, all substitute items must fit in the available space, and be of equal or better quality including efficiency performance, size, and weight, and must be compatible with existing equipment.

1.8 PROJECT RECORD DRAWINGS

- A. Maintain project record drawings in accordance with Division 01.
- B. In addition to the other requirements, mark up a clean set of drawings as the work progresses to show the dimensioned location and routing of all electrical work which will become permanently concealed. Show routing of work in permanently concealed blind spaces within the building. Show complete routing and sizing of any significant revisions to the systems shown.
- C. Record Drawing field mark-ups shall be maintained on-site and shall be available for examination by the Owner's Representative at all times.

1.9 OPERATION AND MAINTENANCE MANUALS

- A. Provide operation and maintenance manuals for training of Owner's Representative in operation and maintenance of systems and related equipment. In addition to requirements referenced in Division 01, the following is required for work provided under this section of the specifications.
- B. Manuals shall be separate from work furnished under other divisions. Prepare a separate chapter for instruction of each class of equipment or system. Index and clearly identify each chapter and provide a table of contents.
- C. Unless otherwise noted in Division 01, provide one copy of all material for approval.
- D. The following is the suggested outline for operation and maintenance manuals and is presented to indicate the extent of items required in manuals.
 1. List chapters of information comprising the text. The following is a typical Table of Contents:
 - a. Electrical Power Distribution
 - b. Lighting
 - c. Control Systems
 - d. Other chapters as necessary.

2. Provide the following items in sequence for each chapter shown in Table of Contents:
 - a. Describe the procedures necessary for personnel to operate the system including start-up, operation, emergency operation, and shutdown.
 - 1) Give complete instructions for energizing equipment and making initial settings and adjustments whenever applicable.
 - 2) Give step-by-step instructions for shutdown procedure if a particular sequence is required.
 - 3) Include test results of all tests required by this and other sections of the specifications.
 - b. Maintenance Instructions:
 - 1) Provide instructions and a schedule of preventive maintenance, in tabular form, for all routine cleaning and inspection with recommended lubricants if required for the following:
 - a) Power distribution equipment
 - b) Light fixtures
 - c) Control systems and equipment
 - 2) Provide instructions for minor repair or adjustments required for preventive maintenance routines, limited to repairs and adjustments which may be performed without special tools or test equipment and which requires no special training or skills.
 - 3) Provide manufacturers' descriptive literature including approved shop drawings covering devices used in system, together with illustrations, exploded views, etc. Also include special devices provided by the Contractor.
 - 4) Provide any information of a maintenance nature covering warranty items, etc., which have not been discussed elsewhere.
 - 5) Include list of all equipment furnished for project, where purchased, technical representative if applicable and a local parts source with a tabulation of descriptive data of all electrical-electronic spare parts and all mechanical spare parts proposed for each type of equipment or system. Properly identify each part by part number and manufacturer.
 - c. Inspection Certificate: Include copy of certificate of final inspection and acceptance from the Authority Having Jurisdiction.

1.10 DEMONSTRATION OF ELECTRICAL SYSTEMS

- A. During substantial completion inspection:
1. Conduct operating test for approval under provisions of Division 01.
 2. Demonstrate installation to operate satisfactorily in accordance with requirements of Contract Documents.
 3. Should any portion of installation fail to meet requirements of Contract Documents, repair or replace items failing to meet requirements until items can be demonstrated to comply.
 4. Have instruments available for measuring voltage values, current values, and for demonstration of continuity, grounds, or open circuit conditions.
 5. Provide personnel to assist in taking measurements and making tests.

1.11 CERTIFICATE OF COMPLETION

- A. Submit, at time of request for final inspection, a completed letter in the following format:
- B. I, (NAME) , of (FIRM) , certify that the electrical work is complete in accordance with Contract Plans and Specifications, and authorized change orders (copies attached) and will be ready for final inspection as of (DATE) . I further certify that the following specification requirements have been fulfilled:
1. Megger readings performed, copies of logs attached.
 2. Ground tests performed, copies of method used and results attached.
 3. Operating manuals complete.

(SIGNED)

Owner's Representative

4. As-built drawings up-to-date and ready to deliver to AVEC.
5. Emergency and alarm systems tested and fully operational:
6. Instruction of operating personnel completed DATE by: (NAME) .
7. All other tests required by specifications have been performed.
8. All systems are fully operational. Project is ready for Final Inspection.

(SIGNED – AVEC)

1.12 WARRANTY

- A. In addition to the requirements of Division 01, or as specified in other sections. Warrant all materials, installation and workmanship for one (1) year from date of acceptance.
- B. Copies of manufacturer product warranties for all equipment shall be included in the operation and installation manuals.

1.13 INSTRUCTION OF OPERATING PERSONNEL

- A. In accordance with the requirements of Division 01 and this section provide services of qualified representative of supplier of each item or system listed below to instruct designated personnel of Owner in operation and maintenance of item or system.
- B. Make instruction when system is complete, of number of hours indicated, and performed at time mutually agreeable.

System or Equipment	Hours of Instruction
Power System	1
Lighting System	1
Controls – Normal Operation	4
Controls – Emergency Operation	2
Controls – Alarms and Troubleshooting	4
Modify/add other sections as necessary	

- C. Certify that an Anchorage, Fairbanks, or Bethel based authorized service organization regularly carries complete stock of repair parts for listed equipment or systems, that organization is available and will furnish service within 48 hours after request. Include name, address and telephone number of service organization.
- D. Have approved operation and maintenance manuals and parts lists for all equipment on hand at time of instruction.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. All Materials and Equipment shall be new.
- B. All Materials and Equipment shall be listed by Underwriter's Laboratories (UL Listed) or approved by the appropriate NRTL agency for the use intended.
- C. Materials and Equipment shall be acceptable to the authority having jurisdiction as suitable for the use intended when installed per listing and labeling instructions.

- D. No materials or equipment containing asbestos in any form shall be used. Where materials or equipment provided by this Contractor are found to contain asbestos such items shall be removed and replaced with non-asbestos containing materials and equipment at no cost to the Owner.
- E. In describing the various items of equipment, in general, each item will be described singularly, even though there may be numerous similar items.

PART 3 - EXECUTION

3.1 WORKMANSHIP

- A. Install Work using procedures defined in ANSI/NECA NEIS and/or the manufacturer's installation instructions.

3.2 TESTS

- A. Perform tests in accordance with Section 26 01 26 – Maintenance Testing of Electrical Systems.
- B. Notify the Owner's representative at least 72 hours prior to conducting any tests.
- C. Following completion of installation, test system ground in accordance with the requirements of ANSI/NETA ATS Section 7.13. and all feeders in accordance with ANSI/NETA ATS Section 7.3. Submit logs of values obtained, and nameplate data of instruments used prior to final inspection. Include a copy of all data in the power distribution section of the Operation and Maintenance Manuals.
- D. Perform additional tests required under other sections of these specifications.
- E. Perform all tests in the presence of the Owner's representative.

END OF SECTION

SECTION 26 05 19 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Building Wire.
- B. Cable.
- C. Wiring Connections and Terminations.

1.2 RELATED SECTIONS

- A. Section 26 01 26 – Maintenance Testing of Electrical Systems.
- B. Section 26 05 53 – Identification for Electrical Systems.
- C. Section 31 23 33 – Trenching and Backfill for Utilities

1.3 REFERENCES

- A. Federal Specification FS-A-A59544 – Cable and Wire, Electrical (Power, Fixed Installation).
- B. Federal Specification FS-J-C-30B – Cable Assembly, Power, Electrical.
- C. ANSI/NEMA WC 70-2009 – Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy.
- D. NETA ATS – Acceptance testing specifications for Electrical Power Distribution and Systems.
- E. NFPA 70 – National Electrical Code.
- F. NFPA 262 – Standard Method of test for flame travel and smoke of wires and cables for use in air-handling spaces.
- G. UL 62 – Flexible Cords and Cables.
- H. UL 83 – Thermoplastic Insulated Wire and Cable.
- I. UL 1063 – Standard for Machine and Tool Wire and Cable.
- J. UL 1424 – Standard for Cables for Power-Limited Fire Alarm.
- K. UL 1479 – Standard for Fire Tests of Through Wall Penetration Fire Stops.
- L. UL 1569 – Standard for Metal Clad Cable.
- M. UL 1581 – Reference Standard for Electrical Wires, Cables and Flexible Cords.

1.4 SUBMITTALS

- A. Submit data under provisions of Division 01 and Section 26 05 00.

- B. Product Data: Submit product data for all components provided which fall under this section showing configurations, finishes, and dimensions. Each catalog sheet should be clearly marked to indicate exact part number provided, including all options and accessories.

PART 2 - PRODUCTS

2.1 BUILDING WIRE

- A. Thermoplastic-insulated Building Wire: NEMA WC 70.
- B. Feeders and Branch Circuits Larger Than #6 AWG: Copper conductor, stranded, 600-volt insulation, THW, THHN/THWN, or XHHW-2 as indicated.
- C. Feeders and Branch Circuits #6 AWG and Smaller: Copper conductor, 600-volt insulation, THHN/THWN or XHHW-2. Conductors smaller than #8 AWG may be either solid or stranded; #6 AWG and #8 AWG conductors shall be stranded.
- D. Branch Circuit Wire Color Code:
 - 1. Color code wires by line or phase as follows:
 - a. Black, red and white for 120/240V systems.
 - 2. For conductors #6 AWG and smaller, insulation shall be colored. For conductors #4 AWG and larger, identify with colored phase tape at all terminals, splices, and boxes.
 - 3. Grounding conductors #6 AWG and smaller shall have green colored insulation. For #4 AWG and larger, use green tape at both ends and at all other visible points in between, including pull and junction boxes.
- E. Control Circuits: Copper, stranded conductor 600-volt insulation, THHN/THNN or XHHW-2.

2.2 NONMETALLIC SHEATHED CABLE

- A. Underground Feeder and Branch Circuit Cable Size #12 AWG through #6 AWG: Copper conductor, 600-volt insulation, rated 90° C in wet or dry locations, Type UF-B.
- B. Service Entrance Cable: Copper or aluminum conductor, 600-volt insulation, rated for 90°C in wet or dry locations, XHHW-2, Type SE.
- C. Underground Service Entrance Cable: Copper or aluminum conductor 600-volt insulation, rated for 90°C in wet or dry locations, XHHW-2, Type USE.

2.3 REMOTE CONTROL AND SIGNAL CABLE

- A. Control Cable for Class 1 Remote Control and Signal Circuits: Copper conductor, 600-volt insulation, rated 90° C, individual conductors twisted together, shielded, and covered with an overall PVC jacket; UL listed.

- B. Control Cable for Class 2 Remote Control and Signal Circuits: Copper conductor, 300-volt insulation, rated 90° C, individual conductors twisted together, shielded, and covered with an overall PVC jacket; UL listed.

2.4 WIRING CONNECTIONS AND TERMINATIONS

- A. For conductors #8 AWG and smaller:
 - 1. Dry interior areas: Spring wire connectors, pre-insulated “twist-on” rated 105 degrees C per UL 468C. Where stranded conductors are terminated on screw type terminals, install crimp insulated fork or ring terminals. Thomas & Betts Sta-Kon or equal.
 - 2. Motor connections: Spring wire connectors, pre-insulated “twist-on” rated 105 degrees C per UL 468C. Provide a minimum of 8 wraps of Scotch 33+ electrical tape around conductors and connector to eliminate connector back off.
 - 3. Wet or exterior: Spring wire connectors, pre-insulated “twist-on”, resin filled rated for direct burial per UL 486D.
- B. For conductors #6 AWG and larger:
 - 1. Bus lugs and bolted connections: 600-v, 90 degrees C., two-hole, long barrel, irreversible compression, copper tin plated. Thomas & Betts or approved equal.
 - 2. Motor connection: 600-v, 90 degrees C., copper tin plated compression motor pigtail connector, quick connect/disconnect, slip on insulator. Thomas & Betts or approved equal.
 - 3. Two-way connector for splices or taps: 600-v, 90 degrees C., compression long barrel, copper tin plated. Thomas & Betts or approved equal. Insulate with Scotch 23 rubber insulating base covering and Scotch 33+ outer wrap.

PART 3 - EXECUTION

3.1 GENERAL WIRING METHODS

- A. Use no wire smaller than #12 AWG for power and lighting circuits, and no smaller than #18 AWG for control wiring.
- B. Use #10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 75 feet.
- C. Splice only in junction or outlet boxes.
- D. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- E. Make Conductor lengths for parallel circuits equal.
- F. Wiring in lighting fixture channels shall be rated for 90° C minimum.

- G. Do not share neutral conductors. Provide a dedicated neutral conductor for each branch circuit that requires a neutral.

3.2 WIRING INSTALLATION IN RACEWAYS

- A. Pull all conductors into a raceway at the same time. Verify that raceway is complete and properly supported prior to pulling conductors. Use UL listed wire pulling lubricant for pulling #4 AWG and larger wires.
- B. Install wire in raceway after all other work likely to injure conductors has been completed.
- C. Do not install XHHW-2 conductors when ambient temperatures are below –5 degrees C and THHN/THWN conductors when ambient temperatures are below 0 degrees C.
- D. Conductors shall be carefully inspected for insulation defects and protected from damage as they are installed in the raceway. Where the insulation is defective or damaged, the cable section shall be repaired or replaced at the discretion of the Owner and at no additional cost to the Owner.
- E. Place an equal number of conductors for each phase of a circuit in same raceway or cable.
- F. Route conductors from each system in independent raceway system and not intermix in the same raceway, enclosure, junction box, wireway, or gutter as another system unless otherwise shown on the plans.
- G. No more than six current carrying conductors shall be installed in any homerun unless otherwise indicated on the drawings or without prior approval from the Engineer.
- H. Completely and thoroughly swab raceway system before installing conductors.
- I. When two or more neutrals are installed in one conduit, identify each with the proper circuit number in accordance with Section 26 05 53.

3.3 CABLE INSTALLATION

- A. Provide protection for exposed cables where subject to damage.
- B. Use spring metal clips or cable ties to support cables from structure. Include bridle rings or drive rings.
- C. Use suitable cable fittings and connectors.
- D. Trench and backfill for direct buried cables per Division 31. Install warning tape along entire length of direct burial cables.

3.4 WIRING CONNECTIONS AND TERMINATIONS

- A. Stranded wire shall not be wrapped around screw terminals.

- B. Splice only in accessible junction boxes.
- C. Thoroughly clean wires before installing lugs and connectors.
- D. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.
- E. Terminate spare conductors with twist on connectors or heat shrink insulation to the proper voltage rating.
- F. Control systems wiring in conjunction with mechanical, electrical, or miscellaneous equipment to be identified in accordance with wiring diagrams furnished with equipment.
- G. Do not exceed manufacturer's recommended pull tensions.
- H. Terminate aluminum wire in accordance with manufacturer's instructions.
- I. Terminate aluminum conductors with tin-plated aluminum-bodied compression connectors only or in accordance with manufacturer's instructions. Fill with anti-oxidant compound prior to installation of conductor.
- J. Use approved suitable reducing connectors or mechanical connector adapters for connecting aluminum conductor to copper conductors.

3.5 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Division 01 and Section 26 01 26.
- B. Inspect wire and cable for physical damage and proper connection.
- C. Torque conductor connections and terminations to manufacturer's recommended values.

END OF SECTION

SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Power System Grounding.
- B. Electronic Safety and Security System Grounding.
- C. Electrical Equipment and Raceway Grounding and Bonding.

1.2 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements, and Section 26 05 00 – Common Work Results for Electrical.
- B. Section 26 01 26 – Maintenance Testing of Electrical Systems.
- C. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.

1.3 REFERENCE STANDARDS

- A. ANSI/NEMA GR-1, Ground Rod Electrodes and Ground Rod Electrode Couplings.
- B. ANSI/NFPA 70 – National Electrical Code.
- C. ASTM B 3 – Standard Specification for Soft or Annealed Copper Wire.
- D. AWS A5.8/A5.8M – Specification for Filler Metals for Brazing and Braze Welding.
- E. IEEE Std 81 – Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System.
- F. IEEE Std 142 – Recommended Practice for Grounding of Industrial and Commercial Power System.
- G. UL 467 – Standard for Grounding and Bonding Equipment.

1.4 SYSTEM DESCRIPTION

- A. Provide a complete grounding system for services and equipment as required by State and Local Codes, NEC, applicable portions of other NFPA codes, and as indicated on the Electrical Drawings and herein.

1.5 SUBMITTALS

- A. Product Data: Submit product data for all components provided, showing material type and dimensions. Each catalog sheet should be clearly marked to indicate exact part number provided, including all options and accessories.
- B. Shop Drawings: Submit shop drawings indicating layout of grounding system, location of main grounding bus, system grounding electrode connections (ground rods, concrete encased electrode, etc.), routing of grounding electrode conductor, and size/type of bonding conductors and termination locations of all major bonding connections (water, piping, steel, fuel tanks, etc.).

1.6 CLOSEOUT SUBMITTALS

- A. Project Record Drawings
 - 1. Show the actual installed layout of grounding system, routing of grounding electrode conductor, and size/type of bonding conductors and termination locations of all major bonding connections (water, piping, steel, fuel tanks, etc.).
- B. Test Reports
 - 1. See Section 26 01 26 - Maintenance Testing of Electrical Systems for Grounding System Tests.
 - 2. The results of the 3-point fall of potential ground resistance test, performed on the installed grounding system shall be submitted in accordance with the paragraph entitled "Field Quality Control" of this section.
 - 3. Each test report shall include:
 - a. Date of test, soil moisture content, and soil temperature.
 - b. Test operator.
 - c. Instrument or other test equipment used.
 - d. Electrode designation or location matching that shown on shop drawings.
 - e. Ground impedance in ohms.
 - f. Assumptions made - if required.

1.7 COORDINATION

- A. Division 01 – Administrative Requirements: Requirements for Coordination.
- B. Complete grounding and bonding of building reinforcing steel prior to concrete placement.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Solid Ground Rods: ANSI/NEMA GR-1, copper-encased steel, $\frac{3}{4}$ inch diameter, minimum length 10 feet. Ground rods shall be clean and smooth.
- B. Bonding Conductors: Solid bare copper wire for sizes #8 AWG and smaller diameter. Stranded bare copper wire for sizes #6 AWG and larger diameter. Conductors may be insulated conductors, if used provide green insulation.
- C. Grounding Conductors: Copper conductor bare or green insulated.
- D. Mechanical Grounding and Bonding Connectors: Non-reversible crimp type lugs only. Use factory made compression lug for all terminations.
- E. Exothermic Grounding and Bonding Connectors: AWS A5.8/A5.8M Exothermic welded type. Welding procedure shall include the proper mold and powder charge and shall conform to the manufacturer's recommendations.
- F. In external locations, clamping shall be used only where a disconnect type of connection is required. Connection device may utilize spring-loaded jaws or threaded fasteners. Device shall be constructed such that positive contact pressure shall be maintained at all times. Machine bolts with tooth-type or spring-type lock washers shall be used.
- G. Ground Ring: Stranded bare copper, size as shown on the drawings. Ground ring shall be continuous around the facility structures, as shown on the drawings. All splices in the ground ring and all connections to the ground ring shall be exothermically welded.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide a separate, insulated equipment-grounding conductor in all feeder and branch circuits. Terminate each end on a grounding lug, bus, or bushing. Multiple conductors on single lug not permitted. Each grounding conductor shall terminate on its own terminal lug.
- B. Connect grounding electrode conductors to metal water pipe using a suitable ground clamp. Make connections to flanged piping at street side of flange. Provide bonding jumper around water meter and back flow preventors.
- C. Provide grounding and bonding at Utility Company's metering equipment.
- D. Bond together system neutrals, service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, receptacle ground connectors, and plumbing and fuel systems.
- E. Grounding conductors for branch circuits shall be sized in accordance with NEC, except minimum size grounding conductor shall be #12 AWG.

- F. Grounding conductor is in addition to neutral conductor and in no case shall neutral conductor serve as grounding means.
- G. Ground rods shall be installed so that the top of the rod is not less than 18 inches below finished grade. Conceal after inspection.

3.2 FIELD QUALITY CONTROL

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.
- B. Perform system ground test as specified in Section 26 01 26 - Maintenance Testing of Electrical Systems.
- C. Upon completion of the ground installation and before connection to the permanent facility power the Contractor shall measure the ground resistance of the grounding electrode system. The testing shall utilize an earth resistance meter and be conducted in accordance with the IEEE Standard for 3-point fall of potential method. The Contractor shall notify the Owner's representatives a minimum of 5 business days prior to the scheduled ground testing date so they may be present at the time of testing. The Contractor shall immediately notify the Owner's representative if the measured ground resistance is above 10 ohms. The Contractor shall submit a copy of the test report to the Owner's representative within 10 days after testing and before the ground system becomes inaccessible.
- D. Ground Isolation Test: Ground systems shall be tested for isolation from other ground system.
- E. Continuity Test: Continuity test shall be performed on all power receptacles to ensure that the ground terminals are properly grounded to the facility ground system.

END OF SECTION

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Section included hangers and supports for Power Systems and Control Systems.
- B. Conduit Supports.
- C. Formed Steel Channel.
- D. Spring Steel Clips.
- E. Equipment Bases and Supports.

1.2 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, sections under Division 01 General Requirements, and Section 26 05 00 – Common Work Results for Electrical.

1.3 REFERENCES

- A. International Building Code (IBC), Chapter 16 – Structural Design.

1.4 SUBMITTALS

- A. Division 01: Requirements for submittals.
- B. Product Data: Submit product data for specialty supports.

1.5 QUALITY ASSURANCE

- A. Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry.

PART 2 - PRODUCTS

2.1 CONDUIT SUPPORTS

- A. Manufacturers:
 - 1. Allied Tube & Conduit Corp.
 - 2. Minerallac Fastening Systems.
 - 3. O-Z Gedney Co.

4. Substitutions: per Division 01.
- B. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.
- C. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.
- D. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.
- E. Conduit clamps - general purpose: One-hole malleable iron for surface mounted conduits.
- F. Cable Ties: High strength nylon temperature rated to 185 degrees F. self-locking.

2.2 FORMED STEEL CHANNEL

- A. Manufacturers:
 1. B-Line Systems.
 2. Allied Tube & Conduit Corp.
 3. Unistrut Corp.
 4. Substitutions: per Division 01.
- B. Product Description: Galvanized 12 gage thick steel. With holes 1-1/2 inches on center.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Division 01: Verification of existing conditions before starting work.
- B. Verify openings are ready to receive sleeves.

3.2 PREPARATION

- A. Obtain permission from Owner's Representative before using powder-actuated anchors.
- B. Obtain permission from Owner's Representative before drilling or cutting structural members.

3.3 INSTALLATION - GENERAL

- A. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using precast insert system, expansion anchors, preset inserts, beam clamps, or spring steel clips.

- B. Use toggle bolts or hollow wall fasteners in hollow masonry partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchor on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.
- C. Do not support raceways, low voltage pathways, cables, telecommunication pathways or boxes from suspension wires or suspended systems. Provide support from allowable structure independently to allow necessary access without removal of electrical system. If dedicated support wires are used, wires and wire clips must be painted or color-coded.
- D. Do not fasten supports to piping, ductwork, fueling equipment, conduit, or suspension system.
- E. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.
- F. In wet locations install free-standing electrical equipment as shown on the Construction Drawings.
- G. Install surface-mounted cabinets and panelboards with minimum of four anchors.
- H. Securely fasten fixtures and equipment to approved structures in accordance with manufacturer's recommendations and to provide necessary earthquake anchorage.

I. Earthquake Anchorages:

- 1. Equipment weighing more than 50 pounds shall be adequately anchored to the building structure to resist lateral earthquake forces.
 - 2. Total lateral (earthquake) forces shall be 1.5 times the equipment weight acting laterally in any direction through the equipment center of gravity. Provide adequate backing at structural attachment points to accept the forces involved.
- J. Provide one seismic support wire for all fixtures weighing less than 10lbs. two minimum color-coded dedicated seismic support wires for each ceiling mounted light fixture weighing less than 50 pounds. Attach support wires to building structure independent from ceiling system and on opposing corners of the light fixtures to not allow fixture to drop more than 6 inches upon ceiling failure. Secure each end with three tight wraps within 1 inch at each end of the wire. Provide four supports on fixtures >50 lbs.

END OF SECTION

SECTION 26 05 33 – RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Metal Conduit.
- B. Flexible Metal Conduit.
- C. Liquidtight Metal Conduit.
- D. Electrical Metallic Tubing.
- E. Nonmetallic Conduit.
- F. Surface Mounted Raceway.
- G. Auxiliary Gutter.
- H. Fittings and Conduit Bodies.
- I. Wall and Ceiling Outlet Boxes.
- J. Pull and Junction Boxes.

1.2 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 01 - General Requirements and Section 26 05 00 – Common Work Results for Electrical.
- B. Division 07 - Thermal and Moisture Protection.
- C. Division 08 - Openings: Access Doors and Frames.
- D. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.
- E. Section 26 05 26 – Grounding and Bonding for Electrical Systems.
- F. Section 26 05 29 – Hangers and Supports for Electrical Systems.
- G. Section 26 05 53 – Identification for Electrical Systems.
- H. Section 26 27 16 – Electrical Cabinets and Enclosures.
- I. Section 26 27 26 – Wiring Devices.

1.3 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
 - 2. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.
 - 3. ANSI C80.5 - Rigid Aluminum Conduit.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM A 123 – Specification for Zinc Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strip.
- C. National Electrical Manufacturers Association (NEMA):
 - 1. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
 - 2. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
 - 3. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.
 - 4. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
 - 5. NEMA TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).
 - 6. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.
 - 7. NEMA TC 7 - Smooth-Wall Coilable Polyethylene Electrical Plastic Conduit.
 - 8. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- D. Underwriters Laboratory (UL):
 - 1. UL 6 - Rigid Steel Conduit, Zinc Coated.
 - 2. UL6A - Rigid Aluminum Conduit.
 - 3. UL 514B – Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
 - 4. UL651B – Continuous Length HDPE Conduit.
- E. National Fire Protection Association (NFPA):
 - 1. NFPA 70 - National Electrical Code.
- F. International Building Code (IBC):

1. IBC chapters 16 and 17 seismic requirements.

1.4 RACEWAY AND BOX INSTALLATION SCHEDULE

- A. Underground more than 5 feet from foundation wall:
 1. Raceway: Provide galvanized rigid steel conduit or rigid schedule PVC conduit.
 - a. Provide detectable warning tape over all underground raceways per section 26 05 53.
 - b. Provide 3-inch minimum spacing between raceways.
 - c. Provide 3/4 inch minus material 6 inches above and below conduit. Backfill remaining trench free of debris or rocks greater than 1 inch in diameter.
 2. Boxes and Enclosures: Provide concrete type 1A handhole as needed.
- B. Under or in concrete slab, or underground within 5 feet of foundation wall:
 1. Raceway: All conduit in contact with concrete or block shall be rigid steel conduit half lapped wrapped with pipe wrap or be plastic-coated conduit. Provide transition to rigid steel conduit 12 inches prior to exit penetration through foundations, concrete walls, or block walls. Provide transition to rigid steel conduit elbow and riser for penetration through slab. Arrange raceway so the curved portion of bend is not visible above finished slab.
 2. Boxes and Enclosures: Provide concrete tight cast and sheet metal steel metal boxes.
- C. In or through CMU walls:
 1. Raceway: All conduit in contact with concrete or block shall be galvanized rigid steel conduit half lapped wrapped with pipe wrap or be plastic-coated conduit.
 2. Boxes and Enclosures: Provide concrete tight cast and sheet metal steel metal boxes.
- D. Outdoor Above Grade, Damp or Wet Interior Locations:
 1. Raceway: Provide galvanized rigid steel conduit.
 2. Boxes and Enclosures: Provide weatherproof malleable iron for branch circuit junction and outlet boxes. Provide weatherproof NEMA 3R sheet metal enclosures for safety and disconnect switches and NEMA 4 sheet metal enclosures with gaskets for motor controllers and control panels.
 3. Fittings: Provide galvanized malleable iron with gaskets. Provide Myers threaded hubs for all conduit entries into top and side of sheet metal enclosures.
- E. Concealed Dry Locations:

1. Raceway: Provide rigid steel conduit or intermediate metal conduit.
 2. Boxes and Enclosures: Provide sheet-metal boxes.
 3. Fittings: Provide galvanized malleable iron and steel.
- F. Exposed Dry Locations:
1. Raceway: Provide rigid steel conduit or intermediate metal conduit.
 2. Boxes and Enclosures: Provide sheet-metal boxes with raised steel covers.
 3. Fittings: Provide galvanized malleable iron and steel.
 4. Surface Raceway and Boxes. Where specifically noted on the Drawings, provide surface raceway and boxes.
- G. Branch Circuits 60 Amperes or Larger and Feeders:
1. Raceway: Provide galvanized rigid steel conduit.
 2. Boxes and Enclosures: Provide sheet-metal boxes.
 3. Fittings: Provide galvanized malleable iron and steel.
- H. Hazardous Locations (Classified Wiring):
1. Raceway: Provide galvanized rigid steel conduit.
 2. Boxes and Enclosures: Provide galvanized malleable iron rated Class 1 Division 1, NEMA FB1.
- I. Equipment Connections: Provide short extensions (three feet maximum) of Liquidtight flexible conduit for connections to motors, transformers, vibrating equipment, or equipment that requires removal for maintenance or replacement.
- J. Electrical metallic tubing and electrical nonmetallic tubing are not approved raceway systems for this project.

1.5 DESIGN REQUIREMENTS

- A. Raceway Minimum Size:
1. Below Grade: Provide 1 inch minimum, unless otherwise noted.
 2. Above Grade or Slab on Grade: Provide 1/2 inch minimum, unless otherwise noted. Raceway may be reduced to 1/2 inch for final connection of raceway up to 6 feet for connection to fixture or device where maximum conduit entry size is 1/2 inch.

3. Line Voltage Circuits: Raceway is sized on the drawings for copper conductors with 600-Volt type XHHW insulation, unless otherwise noted. Where a raceway size is not shown on the drawings, it shall be calculated to not exceed the percentage fill specified in the NEC Table 1, Chapter 9 using the conduit dimensions of the NEC Table 4, Chapter 9 and conductor properties of the NEC Table 5, Chapter 9.
 4. Low-Voltage Circuits: Where installed in raceways, the raceway size shall be calculated to not exceed the percentage fill specified in the NEC Table 1, Chapter 9, using the conduit dimensions of the NEC Table 4, Chapter 9, and cable diameter provided by the manufacturer.
- B. Box Minimum Size: Provide all boxes sized and configured per NEC Article 370 and as specified in this section.
 - C. Seismic Support: Provide support in accordance with section 26 05 29 – Hangers and Supports for Electrical Systems [and 26 05 48 – Vibration and Seismic Support for Electrical Systems].

1.6 SUBMITTALS

- A. Product Data: Submit data for products to be provided.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

PART 2 - PRODUCTS

2.1 RIGID METAL CONDUIT (RMC)

- A. Rigid Steel Conduit: ANSI C80.1, UL 6.
- B. Fittings and Conduit Bodies: NEMA FB 1, UL 514B; Galvanized malleable iron with threaded hubs for all conduit entries. Provide threaded connections and couplings only. Set Screw and running thread fittings are not permitted.
- C. Provide insulated throat bushings at all conduit terminations.

2.2 PVC COATED RIGID METAL CONDUIT

- A. Product Description: NEMA RN 1; rigid steel conduit with external 40-mil PVC coating and 2-mil urethane internal surface.
- B. Fittings and Conduit Bodies: NEMA FB 1, UL 514B; steel fittings with insulated throat bushings and external PVC coating to match conduit.

2.3 INTERMEDIATE METAL CONDUIT (IMC)

- A. Product Description: ANSI C80.6, UL 1242; Galvanized Steel Conduit.
- B. Fittings and Conduit Bodies: NEMA FB 1, UL 514B; use fittings and conduit bodies specified above for rigid steel conduit.
- C. Provide insulated throat bushings at all conduit terminations.

2.4 FLEXIBLE METAL CONDUIT (FMC)

- A. Product Description: UL 1, FS WW-C-566; galvanized or zinc-coated flexible steel, full or reduced-wall thickness.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel or malleable iron with insulated throat bushings. Die cast zinc or threaded inside throat fittings are not acceptable.

2.5 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

- A. Product Description: UL 360, flexible metal conduit with interlocked steel construction and PVC jacket.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; liquid tight steel or malleable iron with insulated throat bushings. Die cast fittings are not acceptable.

2.6 ELECTRICAL METALLIC TUBING (EMT)

- A. Not approved for use on this project.

2.7 RIGID NONMETALLIC CONDUIT (RNC)

- A. Product Description: NEMA TC 2; Schedule 40 [80] PVC, rated for 90° C cable.
- B. Fittings and Conduit Bodies: NEMA TC 3.
- C. Provide PVC-coated rigid steel factory elbows for bends in all plastic conduit runs, regardless of length.

2.8 HIGH DENSITY POLYETHYLENE CONDUIT (HDPE)

- A. Not approved for use on this project.

2.9 ELECTRICAL NONMETALLIC TUBING (ENT)

- A. Not approved for use on this project.

2.10 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, UL514A galvanized steel, with plaster ring where applicable.
 - 1. Minimum Size: 4 inches square or octagonal, 1-1/2 inches deep, unless otherwise noted.

2. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch male fixture studs where required. Minimum Size: 4 inches square or octagonal, 2-1/8 inches deep.
 3. Concrete and Masonry: Concrete type with field installed tape cover to prevent concrete entry to raceway system. Minimum Size: 4 inches square, 2-1/8 inches deep.
 4. Low Voltage Systems: Minimum size 4-11/16 inches square, 2-1/8 inches deep.
- B. Vapor Barrier Boxes: Airtight box with vapor barrier flange and integral wire entry seal. Lessco, Nutek, Enviroseal, or approved equal.
- C. Cast Boxes: NEMA FB 1, Type FD, galvanized malleable iron. Furnish gasketed cover by box manufacturer. Furnish threaded hubs. "Bell" boxes are not acceptable.
- D. Wall Plates: As specified in Section 26 27 26.

2.11 PULL AND JUNCTION BOXES

- A. Sheet Metal Pull and Junction Boxes: ANSI/NEMA OS 1, UL514A galvanized steel.
1. Minimum Size: 4 inches square or octagonal, 1-1/2 inches deep, unless otherwise noted.
- B. Nonmetallic Pull and Junction Boxes: ANSI/NEMA OS 2, thermoset, phenolic with 150°C fire rating.
1. Minimum Size: 6 inches square, 4 inches deep, unless otherwise noted.
- C. Sheet Metal Boxes Larger Than 12 Inches in Any Dimension: Hinged enclosure. Hoffman or approved equal.
- D. Cast Metal Boxes for Outdoor and Wet Location Installations: NEMA 250, Type 4X; flat-flanged, surface mounted junction box, UL listed as raintight:
1. Material: Galvanized cast iron.
 2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover and screws.
- E. Cast Metal Boxes for Underground Installations: NEMA 250, Type 4; flat-flanged, flush-mounted junction box, UL listed as raintight:
1. Material: Galvanized cast iron.
 2. Cover: Furnish with outside flange, neoprene gasket, and recessed stainless steel cover and screws.

- F. Fiberglass Concrete composite Type 1A Handholes: Die-molded glass-fiber concrete composite hand holes with pre-cut 6 x 6 inch cable entrance at center bottom of each side:
 - 1. Cover: Glass-fiber concrete composite, weatherproof cover with non-skid finish.
 - 2. Cover Legend: "ELECTRIC".

- G. Polymer Concrete Junction Boxes for Underground Installations: Polymer concrete consisting of sand and aggregate bound together with a polymer resin. Internal reinforcement shall be provided by means of steel, fiberglass or a combination of the two. The installed enclosure shall be rated for a minimum test load of 7500 pounds distributed over a 10 inch by 10 inch area and used in occasional, non-deliberate vehicular traffic or pedestrian traffic application. All hardware shall be stainless steel.

2.12 RACEWAY SEALING FITTINGS

- A. Galvanized malleable iron, galvanized filled with sealing compound.
 - 1. Class 1 Division 1 boundary lines and isolation of arcing devices use Class 1 Division 1 sealing compound.

2.13 BUSHINGS

- A. Non-grounding: Threaded impact resistant plastic.
- B. Grounding: Insulated galvanized malleable iron/steel with hardened screw bond to raceway and conductor lug.

2.14 LOCKNUTS

- A. Threaded Electro Zinc Plated Steel designed to cut through protective coatings for ground continuity.

2.15 WIREWAY

- A. Product Description: General purpose type wireway. Size per NEC minimum fill capacity required.
- B. Knockouts: Field-installed, no factory knockouts acceptable.
- C. Cover: Screw cover.
- D. Fittings and Accessories: Include factory couplings, offsets, elbows, adapters and support straps required for a complete system. Provide internal ground bonding jumper bonded to each section.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Ground and bond raceway and boxes in accordance with Section 26 05 26.
- B. Provide seismic support and fasten raceway and box supports to structure and finishes in accordance with Section 26 05 29.
- C. Identify raceway and boxes with origin and destination in accordance with Section 26 05 53.
- D. Unless otherwise noted, do not inter-mix conductors from separate panelboards or any other system in the same raceway system or junction boxes.

3.2 INSTALLATION - GENERAL RACEWAY

- A. Install raceway for all systems, unless otherwise noted.
- B. Install an equipment grounding conductor inside of all flexible raceways containing line voltage conductors.
- C. Provide raceways concealed in construction unless specifically noted otherwise, or where installed at surface cabinets, motor and equipment connections and in Mechanical and Electrical Equipment rooms. Do not route conduits on roofs, outside of exterior walls, or along the surface of interior finished walls unless specifically noted on the plans.
- D. Raceway routing and boxes are shown in approximate locations unless dimensioned. Where raceway routing is not denoted, field-coordinate to provide complete wiring system.
- E. Do not route raceways on floor. Arrange raceway and boxes to maintain a minimum of 6 feet 6 inches of headroom and present a neat appearance. Install raceways level and square to a tolerance of 1/8" per 10 feet. Route exposed raceways and raceways above accessible ceilings parallel and perpendicular to walls, ceiling, and adjacent piping.
- F. Maintain minimum 6-inch clearance between raceway and mechanical and piping and ductwork. Maintain 12-inch clearance between raceway and heat sources such as flues, steam pipes, heating pipes, heating appliances, and other surfaces with temperatures exceeding 104 degrees F.
- G. Do not install raceway imbedded in spray applied fire proofing. Seal raceway penetrations of fire-rated walls, ceilings, floors in accordance with the requirements of Section 26 05 00 and Division 07.
- H. Raceways and boxes penetrating vapor barriers or penetrating areas from cold to warm shall be taped and sealed with a non-hardening duct sealing compound to prevent the accumulation of moisture, and shall include a vapor barrier on the outside.
- I. Conduit embedded in concrete or solid masonry shall not be larger than 1/3 the thickness of the wall or slab and shall be spaced not less than three diameters apart. No cutting of reinforcing bars shall be permitted unless specifically approved. Should

structural members prevent the installation of conduit or equipment, notify the Contracting Officer before proceeding.

- J. Arrange raceway supports to prevent misalignment during wiring installation. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- K. Group raceway in parallel runs where practical and use conduit rack constructed of steel channel with conduit straps or clamps, as specified in Section 26 05 29. Provide space on each rack for 25 percent additional raceway.
- L. Cut conduit square; de-burr cut ends. Bring conduit to the shoulder of fittings and couplings and fasten securely. Where locknuts are used, install with one inside box and one outside with dished part against box.
- M. Use threaded raintight conduit hubs for fastening conduit to cast boxes, and for fastening conduit to sheet metal boxes in damp or wet locations. Sealing locknuts are not acceptable.
- N. Install no more than the equivalent of three 90-degree bends between boxes.
- O. Install conduit bodies to make sharp changes in direction, such as around beams. "Goosenecks" in conduits are not acceptable.
- P. Use hydraulic one-shot conduit bender or factory elbows for bends in conduit larger than 2 inch size.
- Q. Provide protective plastic bushings or insulated throat bushings at each raceway termination not installed to an enclosure. Bushings shall be threaded to the raceway end or connector.
- R. Avoid moisture traps; install junction box with drain fitting at low points in raceway system.
- S. Provide weatherhead on all raceway stub ups which are outdoors and do not terminate into equipment.
- T. Use cable sealing fittings forming a watertight non-slip connection to pass cords and cables into conduit. Size cable sealing fitting for the conductor outside diameter. Use Appleton CG series or equal cable sealing fittings.
- U. Use suitable caps to protect installed raceway against entrance of dirt and moisture.
- V. Paint all exposed conduit to match surface to which it is attached or crosses. Clean greasy or dirty conduit prior to painting in accordance with paint manufacturer's instructions. Where raceway penetrates non-rated ceilings, floors or walls, provide patching, paint and trim to retain architectural aesthetics similar to surroundings.
- W. Coat non-ferrous conduit threads prior to joining with conductive metallic grease antioxidant.

- X. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area that will be inserted into fitting. Let joint cure for 20 minutes minimum.

3.3 INSTALLATION – GENERAL BOXES

- A. Provide electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and code compliance. All electrical box locations shown on Drawings are approximate unless dimensioned.
- B. Coordinate layout and installation of boxes to provide adequate headroom and working clearance. Coordinate mounting heights and locations of outlets.
- C. Align surface-mounted outlet boxes for switches and similar devices.
- D. Use multiple-gang boxes where more than one device are mounted together; do not use sectional boxes. Provide barriers to separate wiring of different voltage systems and where normal and emergency power circuits occur in the same box.
- E. Adjust box location up to 6 feet prior to rough-in to accommodate intended purpose.
- F. Orient boxes to accommodate wiring devices oriented as specified in Section 26 27 26.
- G. Provide knockout closures for unused openings.
- H. Do not fasten boxes to support wires or other piping systems.
- I. Support boxes independently of conduit.
- J. Clean interior of boxes to remove dust, debris, and other material and clean exposed surfaces and restore finish.
- K. Provide blank weatherproof covers or plates for all boxes that do not contain devices.

3.4 INSTALLATION – BURIED CONDUITS

- A. Excavation and backfilling shall be in accordance with these specifications and the applicable portions of Division 31:
 - 1. Excavate and backfill as necessary for proper installation or work.
 - 2. Provide bracing and shoring as necessary or required.
 - 3. Compact backfill under footings, floor slabs and paving using materials and methods specified under Division 31, Earthwork.
 - 4. All conduits outside the building perimeter shall be buried a minimum of 24 inches below grade. Bottom of trench shall be smoothed and all rocks and cobbles 3 inches and larger shall be removed. Conduits shall be bedded in a minimum of 2 inches of sand and shall have a cover of 2 inches minimum of

sand. Trench shall be backfilled with non-frost susceptible material and compacted.

5. Damage to existing underground utilities shall be repaired immediately by the Contractor at no cost to the Owner.

END OF SECTION

SECTION 26 05 53 – IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Nameplates and Tape Labels.
- B. Wire and Cable Markers.
- C. Conduit Color-Coding.
- D. Wire Markers.
- E. Conduit Markers.
- F. Underground Warning Tape.

1.2 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements, and Section 26 05 00 – Common Work Results for Electrical.
- B. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.
- C. Section 26 05 33 – Raceway and Boxes for Electrical Systems.
- D. Section 26 24 16 – Panelboards.
- E. Section 26 27 26 – Wiring Devices.

1.3 SUBMITTALS

- A. Division 01 and Section 26 05 00 – Common Work Results for Electrical.
- B. Product Data:
 - 1. Submit manufacturer's catalog literature for each product required.
 - 2. Submit electrical identification schedule including list of wording, symbols, letter size, color-coding, tag number, location, and function.

1.4 ENVIRONMENTAL REQUIREMENTS

- A. Install labels and nameplates only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

PART 2 - PRODUCTS

2.1 NAMEPLATES

- A. Product Description: Laminated three-layer plastic with engraved white letters on black background. Nameplate for service disconnect shall be engraved white letters on red background.
- B. Letter Size:
 - 1. 1/4-inch high letters for identifying individual panel or equipment.
 - 2. 1/8-inch high letters for remaining lines with 1/8 inch spacing between lines.
- C. Minimum nameplate size: 1/8 inch thick with a consistent length and height for each type of nameplate wherever installed on the project.

2.2 TAPE LABELS

- A. Product Description: Adhesive tape labels, with 3/16 inch Bold Black letters on clear background made using Dymo Rhino series label printer or approved equal.
- B. Embossed adhesive tape will not be permitted for any application.

2.3 WIRE MARKERS

- A. Power and Lighting Description: Machine printed heat-shrink tubing, cloth or wrap-on type, for all neutrals and Phase conductors.
- B. Low Voltage System Description: Self-adhesive machine printed label with unique wire number that is shown on shop drawing for system.

2.4 UNDERGROUND WARNING TAPE

- A. Product Description: Red, 6-inch wide, detectable.
- B. Wording to read "Caution – Buried Electric Line Below".

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

- A. Degrease and clean surfaces to receive nameplates and tape labels.
- B. Install nameplates and tape labels parallel to equipment lines.
- C. Underground Warning Tape Installation: Install underground warning tape along length of each underground conduit, raceway, or cable 6 to 8 inches below finished grade, directly above buried conduit, raceway, or cable.

3.2 NAMEPLATE INSTALLATION

- A. Secure nameplates to equipment fronts using machine screws tapped and threaded into panelboard, or using rivets. The use of adhesives is not acceptable. Machine screws to not protrude more than 1/16 inch on back side.
- B. Service Disconnect Nameplate: Provide nameplate on exterior service disconnect that reads "SERVICE DISCONNECT".
- C. Distribution Panel Nameplates:
 - 1. Provide overall equipment identification.
 - a. Line 1: Distribution panel name.
 - b. Line 2: Source which panelboard is fed.
 - c. Line 3: Voltage, phase and wire configuration.
 - d. Line 4: AIC rating of the panel.
 - e. Line 5: Where applicable, indicate that panel is series-rated.
 - 2. Provide circuit breaker identification for each feeder breaker.
 - a. Line 1: Name of panelboard or equipment served.
 - b. Line 2: Location of served panelboard.
- D. Branch Panelboard Nameplates:
 - 1. Provide nameplate for each panelboard with the following information:
 - a. Line 1: Panelboard name.
 - b. Line 2: Source from which the panelboard is fed.
 - c. Line 3: Voltage, phase and wire configuration.
 - d. Line 4: AIC rating of the panelboard.
- E. Disconnects, Starters, or Contactors:
 - 1. Provide nameplate for each device with the following information:

- a. Line 1: Load served.
- b. Line 2: Panelboard and circuit number from which the device is fed.
- c. Line 3: Fuse or Circuit amperage and poles. Where fused disconnect is installed, denote the maximum fuse size to be installed.

F. Control or Low Voltage System Panels:

1. Provide nameplate for each control panel with the following information:

- a. Line 1: Unique panel name as shown on the shop drawings.
- b. Line 2: System description
- c. Line 3: Panelboard and circuit number from which the panel.

3.3 LABEL INSTALLATION

A. Conduit Feeder Labels - Provide conduit labels on all feeder raceways as follows:

1. Panelboards – “PANEL xxxx”.

B. Spare Raceways: Provide raceway label on each individual raceway denoting the source and termination point at each end.

C. Low-Voltage System Device Labels: Provide label on each device, denoting device ID or address where applicable. Affix label to device faceplate for ceiling-mounted devices or wall-mounted devices above 8'-0" AFF. Affix label inside backbox for exterior devices.

3.4 WIRE IDENTIFICATION

A. Provide wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connection. Identification shall be as follows:

1. Markers shall be located within one inch of each cable end, except at panelboards, where markers for branch circuit conductors shall be visible without removing panel deadfront.
2. Each wire and cable shall carry the same labeled designation over its entire run, regardless of intermediate terminations.
3. Color code phases, neutral, and ground per NEC requirements and Section 26 05 19.
4. Color-code all low-voltage system wires and cables in accordance with the individual sections in which they are specified.

5. For power and lighting circuits, identify with branch circuit or feeder number.
 6. Control Circuits: Control wire number as indicated on schematic and shop drawings.
- B. Provide pull string markers at each end of all pull strings. Marker shall identify the location of the opposite end of the pull string.

3.5 JUNCTION BOX IDENTIFICATION

- A. Label each lighting and power junction box with the panelboard name and circuit number.

3.6 DEVICE PLATE IDENTIFICATION

- A. Label each receptacle device plate or point of connection denoting the panelboard name and circuit number.
- B. Install adhesive label on the top of each plate.

3.7 PANELBOARD IDENTIFICATION

- A. Provide panelboard circuit directories in accordance with Section 26 24 16.

3.8 LOW-VOLTAGE SYSTEM IDENTIFICATION

- A. Install all labeling in accordance with the requirements of this section and of each section where the individual systems are specified.

END OF SECTION

SECTION 26 08 00

COMMISSIONING OF ELECTRICAL AND CONTROL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. The requirements of this section apply to all sections of Divisions 26
- B. This project will have selected building systems commissioned.
- C. Related Sections:
 - 1. Division 01 and 26 Specifications

1.2 REFERENCES

- A. National Electrical Testing Agency.

1.3 COMMISSIONED SYSTEMS

- A. Commissioning of a system or systems specified in Divisions 26 is part of the construction process. Documentation and testing of these systems, as well as training of the Owner's Operation and Maintenance personnel in accordance with the requirements of Division 26, is required.
- B. The Facility electrical systems commissioning will include all of the control panels provided or modified under this project.
- C. Electrical and Controls Systems commissioning process includes the following tasks:
 - 1. Testing and startup of Electrical and Control equipment and systems.
 - 2. Equipment and system verification checks.
 - 3. Assistance in functional performance testing to verify testing and equipment and system performance.
 - 4. Provide qualified personnel to assist in commissioning tests.
 - 5. Complete and endorse functional performance test checklists provided by Engineer to assure equipment and systems are fully operational and ready for functional performance testing.
 - 6. Provide equipment, materials, and labor necessary to correct deficiencies found during commissioning process to fulfill contract and warranty requirements.
 - 7. Provide operation and maintenance information and record drawings to Engineer for review verification and organization, prior to distribution.
 - 8. Provide assistance to Engineer to develop, edit, and document system operation descriptions.

9. Provide training for systems specified in this Section with coordination by Engineer.
- D. Equipment and Systems to Be Commissioned:
 1. New Electrical and Control systems that were installed under this Contract.
 2. Existing Electrical and Control systems that were modified, adjusted, upgraded, or affected by the work performed under this Contract.
- E. The following is a partial list of equipment that may be included in this Commissioning:
 1. Corporation Fuel System Controls
 2. City Fuel System Controls
 3. AVEC Plant Fuel Supply Controls and Inventory Monitor
 4. All instrumentation related to new control and alarm panels.

1.4 COMMISSIONING SUBMITTALS

- A. Draft Forms: Submit draft of system verification form and functional performance test checklist.
- B. Test Reports: Indicate data on system verification form for each piece of equipment and system as specified.
- C. Field Reports: Indicate deficiencies preventing completion of equipment or system verification checks equipment or system to achieve specified performance.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 77 19 - Closeout Requirements
- B. Project Record Documents: Record revisions to equipment and system documentation necessitated by commissioning.
- C. Operation and Maintenance Data: Submit revisions to operation and maintenance manuals when necessary revisions are discovered during commissioning.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with NETA requirements.
- B. Maintain one copy of each document on site.

1.7 COMMISSIONING RESPONSIBILITIES

- A. Equipment or System Installer Commissioning Responsibilities:

1. Attend commissioning meetings.
2. Ensure controls installer performs assigned commissioning responsibilities as specified below.
3. Ensure calibration agency performs assigned commissioning responsibilities as specified.
4. Provide instructions and demonstrations for Owner's personnel.
5. Ensure subcontractors perform assigned commissioning responsibilities.
6. Ensure participation of equipment manufacturers in appropriate startup, testing, and training activities when required by individual equipment specifications.
7. Develop startup and initial checkout plan using manufacturer's startup procedures and functional performance checklists for equipment and systems to be commissioned.
8. During verification check and startup process, execute process related portions of checklists for equipment and systems to be commissioned.
9. Perform and document completed startup and system operational checkout procedures, providing copy to Engineer.
10. Provide manufacturer's representatives to execute starting of equipment. Ensure representatives are available and present during agreed upon schedules and are in attendance for duration to complete tests, adjustments and problem-solving.
11. Coordinate with equipment manufacturers to determine specific requirements to maintain validity of warranties.
12. Provide personnel to assist Engineer during equipment or system verification checks and functional performance tests.
13. Prior to functional performance tests, review test procedures to ensure feasibility, safety and equipment protection and provide necessary written alarm limits to be used during tests.
14. Prior to startup, inspect, check, and verify correct and complete installation of equipment and system components for verification checks included in commissioning plan. When deficient or incomplete work is discovered, ensure corrective action is taken and re-check until equipment or system is ready for startup.
15. Provide factory supervised startup services for equipment and systems specified in Division 26. Coordinate work with manufacturer and Engineer.
16. Perform verification checks and startup on equipment and systems as specified.
17. Assist Engineer in performing functional performance tests on equipment and systems as specified.
18. Perform operation and maintenance training sessions scheduled by Engineer.
19. Conduct process system orientation and inspection.

B. Controls Installer Commissioning Responsibilities:

1. Attend commissioning meetings.
2. Review design for ability of systems to be controlled including the following:
 - a. Confirm proper hardware requirements exists to perform functional performance testing.
 - b. Confirm proper safeties and interlocks are included in design.
 - c. Confirm proper sizing of system control valves and actuators and control valve operation will result capacity control identified in Contract Documents.

- d. Confirm proper sizing of system control dampers and actuators and damper operation will result in proper damper positioning.
 - e. Confirm sensors selected are within device ranges.
 - f. Review sequences of operation and obtain clarification from Architect/Engineer.
 - g. Provide written sequences of operation for packaged controlled equipment. Equipment manufacturers' stock sequences may be included, when accompanied by additional narrative to reflect Project conditions.
3. Inspect, check, and confirm proper operation and performance of control hardware and software provided in other Electrical and Controls sections.
 4. Submit proposed procedures for performing automatic control system point-to-point checks to Engineer and Architect/Engineer.
 5. Inspect check and confirm correct installation and operation of automatic control system input and output device operation through point-to-point checks.
 6. Perform training sessions to instruct Owner's personnel in hardware operation, software operation (if applicable) , programming, and application in accordance with commissioning plan and requirements of Divisions 26..
 7. Demonstrate system performance and operation to Engineer during functional performance tests including each mode of operation.
 8. Provide control system technician to assist during Engineer verification check and functional performance testing.
 9. Provide control system technician to assist testing, adjusting, and balancing agency during performance of testing, adjusting, and balancing work.
 10. Assist in performing operation and maintenance training sessions scheduled by Engineer.
- C. Testing, Adjusting, and Calibration Agency Commissioning Responsibilities:
1. Attend commissioning meetings.
 2. Participate in verification of testing, adjusting, and calibration report for verification or diagnostic purposes.
 3. Assist in performing operation and maintenance training sessions scheduled by Engineer.

1.8 COMMISSIONING MEETINGS

- A. Attend initial commissioning meeting and progress commissioning meetings as required by Engineer.

1.9 COORDINATION

- A. Section 01 31 19 – Project Meetings.
- B. Notify Engineer minimum of four weeks in advance of the following:
 1. Scheduled equipment and system startups.
 2. Scheduled automatic temperature control system checkout.

3. Scheduled start of testing, adjusting, and calibration work.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 CONSTRUCTION INSPECTIONS

- A. Commissioning of Electrical systems will require inspection of individual elements of the electrical systems construction throughout the construction period. The Contractor shall coordinate with the Engineer to schedule electrical systems inspections as required to support the Commissioning Process.

3.2 PRE-FUNCTIONAL CHECKLISTS

- A. The Contractor shall complete Pre-Functional Checklists to verify systems, subsystems, and equipment installation is complete and systems are ready for Systems Functional Performance Testing.
- B. The Engineer will prepare Pre-Functional Checklists to be used to document equipment installation. The Contractor shall complete the checklists. Completed checklists shall be submitted to the Owner and to the Engineer for review. The Engineer may spot check a sample of completed checklists.
- C. If the Engineer determines that the information provided on the checklist is not accurate, the Engineer will return the marked-up checklist to the Contractor for correction and resubmission. If the Engineer determines that a significant number of completed checklists for similar equipment are not accurate, the Engineer will select a broader sample of checklists for review.
- D. If the Engineer determines that a significant number of the broader sample of checklists is also inaccurate, all the checklists for the type of equipment will be returned to the Contractor for correction and resubmission.

3.3 CONTRACTORS TESTS

- A. Contractor tests as required by other sections of Division 26 shall be scheduled and documented in accordance with Section 01 00 00 GENERAL REQUIREMENTS. All testing shall be incorporated into the project schedule. Contractor shall provide no less than 7 calendar days' notice of testing. The Engineer will witness selected Contractor tests at the sole discretion of the Engineer. Contractor tests shall be completed prior to scheduling Systems Functional Performance Testing.

3.4 SYSTEMS FUNCTIONAL PERFORMANCE TESTING

- A. The Commissioning Process includes Systems Functional Performance Testing that is intended to test systems functional performance under steady state conditions, to test system reaction to changes in operating conditions, and system performance under emergency conditions. The Engineer will prepare detailed Systems Functional Performance Test procedures for review and approval by the Engineer. The Contractor shall review and comment on the tests prior to approval. The Contractor shall provide the required labor, materials, and test equipment identified in the test procedure to perform the tests. The Engineer will witness and document the testing. The Contractor shall sign the test reports to verify tests were performed.

3.5 TRAINING OF OWNER'S PERSONNEL

- A. Training of the operation and maintenance personnel is required. Provide competent, factory authorized personnel to provide instruction to operation and maintenance personnel concerning the location, operation, and troubleshooting of the installed systems. Contractor shall submit training agendas and trainer resumes. The instruction shall be scheduled in coordination with the Engineer after submission and approval of formal training plans.

END OF SECTION

SECTION 26 09 19 – ENCLOSED CONTACTORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Enclosed Contactors.

1.2 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements and Section 26 05 00 – Common Work Results for Electrical.
- B. Section 26 05 26 – Grounding and Bonding for Electrical Systems.
- C. Section 26 05 53 – Identification for Electrical Systems.
- D. Section 26 09 23 – Lighting Control Devices: Photocell or Timer Control for Lighting Circuits.
- E. Section 26 24 16 - Panelboards: Installation of Contactors.
- F. Section 26 27 16 – Cabinets and Enclosures.

1.3 REFERENCES STANDARDS

- A. ANSI/NEMA ICS 6 - Enclosures for Industrial Controls and Systems.
- B. NEMA ICS 2 - Industrial Control Devices, Controllers, and Assemblies.

1.4 SUBMITTALS

- A. Product Data: Submit product data for all components provided, showing electrical characteristics and connection requirements. Each catalog sheet should be clearly marked exact part number provided.
- B. Shop Drawings: Submit shop drawings include outline drawings with dimensions, and equipment ratings for voltage, capacity, and poles.

1.5 CLOSEOUT SUBMITTALS

- A. Project Record Drawings: Accurately indicate actual locations of each contactor and indicate circuits controlled.
- B. Operation and Maintenance Manuals: Submit instructions for replacing and maintaining coil and contacts.

1.6 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience and ISO 9000 certified.
- B. Installer: Company specializing in installing products specified in this section with minimum three years' experience.

PART 2 - PRODUCTS

2.1 MANUFACTURERS – ENCLOSED CONTACTORS

- A. Square D.
- B. Cutler Hammer.
- C. ASCO.
- D. Substitutions: Under provisions of Division 01.

2.2 ENCLOSED CONTACTORS

- A. Contactors: NEMA ICS 2; mechanically held, 2 wire control.
- B. Coil Operating Voltage: 120/240 volts, 60 Hertz.
- C. Multipole Lighting Contactor: NEMA ICS 2; 30A, 4-pole with coil clearing contacts, Hand-Off-Auto switch and red pilot light.
- D. General Purpose Contactor: NEMA ICS 2; size to match motor load controlled or as indicated on Drawings.
- E. Enclosure: ANSI/NEMA ICS 6; Type 4X.
- F. Provide solderless pressure wire terminals.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Require marking of terminals and wires landing on terminals.

3.2 FIELD QUALITY CONTROL

- A. Verify wiring connections are tight.
- B. Verify movable contact assemblies are not binding and are free to move.
- C. Verify coil voltage is correct.
- D. With load connected energize and observe load current for each circuit installed.

END OF SECTION

SECTION 26 09 20

FUEL OIL AND GASOLINE CONTROL PANEL

PART 1 - GENERAL

1.1 SCOPE

- A. Contractor shall furnish industrial control panels as required for use with a fuel oil and gasoline tank farm.

1.2 DESCRIPTION

- A. The control panel controls all motor-driven and other electrically operated equipment comprising the fuel oil and gasoline control system. The various components are fully interlocked for fail-safe operation as shown on the drawings. The operation of all driven components can be manually overridden for equipment startup or troubleshooting. The status of all components and alarms is indicated via illuminated devices located at the control panel enclosure.

1.3 SUBMITTALS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section. Provide in addition:
 - 1. Identifying Listing / Labeling Third Party Laboratory on plans.
 - 2. Complete schematic drawings with OEM developed wire numbering system and terminal. Submit the following information and shop drawings for approval prior to panel fabrication:
 - a. Ladder diagram showing control logic.
 - b. Scaled, panel layout drawing showing terminal blocks, relays, switches, lamps, and etc.
 - c. Material list, of all components.
 - d. Labeling information showing compliance with UL 508A.
 - e. Spare parts list (fuses, lamps, relays).
 - f. Shop acceptance test procedure.
 - g. Complete Bill of Materials on plans.

1.4 SUMMARY

- A. Provide control panels as shown on drawings. General arrangement and control characteristics are shown, contractor is responsible for final panel design. Panels are to be discrete relay logic, programmable controllers are not acceptable.
- B. Panels shall be assembled and listed per UL 508a standard for safety for industrial control panels, and the NEC.
- C. Submit the following information and shop drawings for approval prior to panel fabrication:
 - 1. Ladder diagram showing control logic.
 - 2. Scaled, panel layout drawing showing terminal blocks, relays, switches, lamps, and etc.
 - 3. Material list, of all components.
 - 4. Labeling information showing compliance with UL 508A.
 - 5. Spare parts list (fuses, lamps, relays).
 - 6. Shop acceptance test procedure.
- D. Exterior mounted panels shall be NEMA 4X SS dead front construction with clear access windows displaying status and alarms as shown, interior mounted panels shall be NEMA 12 construction. Properly seal any un-used openings. Panel fronts may not have any plugged or un-plugged openings.
- E. Exterior panels shall include a lockable hinged cover, with no controls. All controls shall be mounted on a hinged "dead front" panel within the enclosure. Terminal strips, relays, and all wiring shall be mounted behind the hinged "dead front" cover.
- F. Interior panels may have the controls mounted on the hinged cover. All terminal strips, relays, and all wiring shall be mounted within the panel.
- G. Provide over current protection on power circuits as they enter the control panel. Size over current protection devices per the NEC.
- H. All panels shall include a removable backplane for mounting equipment.
- I. Panel control equipment (switches, pushbuttons, indicator lamps) shall be 30.5mm size, Allen Bradley bulletin 800t/800h or equal.

- J. All wiring shall be terminated on terminal strips or device screw connections. Terminal strips shall be Allen Bradley bulletin 1492, NEMA terminal blocks or terminal block relays, or equal. Size terminal blocks per manufacturers recommendations. Provide 25% spare terminals. Terminals shall be labeled, and shall correspond to identification labels on shop drawings.
- K. All relays, power supplies, fuse holders and circuit breakers shall be din rail mounted.
- L. Use heat-shrink wire markers to label all wiring within the panel. Wiring shall correspond to ladder diagram terminal block designators where shown. Where not shown panel vendor shall provide terminal assignments and update plans to reflect assignments.

PART 2 - PRODUCTS

2.1 EQUIPMENT DESIGN REQUIREMENTS

- A. Control panel shall be designed and built to UL508 Industrial Control Panel requirements.
- B. Control panel shall be manufactured in a listed Industrial Control Panel Manufacturing Facility.
- C. Control panel enclosure shall be Hoffman or equal, as required for the application.
- D. Control panel assemblies.
 - 1. Control panels shall be factory or shop fabricated units completely assembled, wired and tested in the presence of an owner representative before shipment to the job site. Panel construction shall, in general, meet JIC EMP-1-1967 standards and applicable NEMA and IEEE standards. The panels shall be constructed in accordance with the standards of and bear the label of an accredited nationally recognized testing laboratory.
 - 2. All operable selectors and pushbuttons, including motor overload reset, shall be accessible at the panel door exterior.
 - 3. Components mounted in the interior shall be fastened to an interior back panel using machine screws plus adhesive to insure vibration-free attachment.

4. Wiring duct shall be provided for wiring within the panel enclosure including all field wiring. Wiring within the panel shall be labeled with wire numbers and run in wiring duct neatly tied and bundled with tie wraps or similar materials.
5. Line voltage (120 volt or higher) wiring in panels shall be class C stranded copper conductor #16AWG minimum , with type MTW or SIS insulation.
6. Control conductors to be industry standard (NFPA 79) or Listing Agency requirements.
7. White with blue stripe: grounded (current-carrying) dc circuit conductors.
8. Wiring which is an internal part of a device and is not connected to external terminal blocks may be wired using the manufacturer's standard wire designations. Wire which connects to external circuits, to terminal blocks, or the numbers shown on the elementary wiring diagrams shall identify other devices that are connected to external circuits. Every wire termination, including all jumpers, shall be identified with wire markers. Wire markers shall be installed over wire terminators or directly adjacent to them. Markers shall be arranged to permit reading of identification.
9. Terminal blocks shall be provided for the termination of power and control wiring. Where multiple terminal blocks are shown for a given wire number or common circuit, additional blocks shall be provided and jumpered as necessary to provide terminal spaces for each individual outgoing wire.
10. Terminal strips shall be mounted on a flat steel channel or strut which raises them to the level of the adjacent wire gutters (2 inch to 3 inch above back panel). Terminal strips shall be mounted at least 6 inches from panel inner walls. Terminal strips shall be labeled by machine print – hand lettered terminal numbered are not permitted.
11. Provide space for a minimum of 25 percent additional control wiring terminal blocks on each side.
12. Nameplates shall be provided for all relays, timers, transformers, fuses, terminal block, switches mounted internally, and other components that are mounted to the internal mounting panel. These nameplates shall be sized to the scale of the device to which they refer. The engraving shall be as shown on the panel layout drawing.

13. The assembled panel shall be meggered and tested to be free from grounds and shorts. All controllers, circuits and interlocks shall be rung out and tested to assure that they function correctly before the panel is shipped. Revise all drawings upon completion of the work to show "as shipped" condition of the panel.
 14. After completion of shop assembly and testing, panels shall be enclosed in heavy-duty polyethylene envelopes or secured sheeting to provide complete protection from dust and moisture. Dehumidifiers shall be placed inside the polyethylene covering. The equipment shall then be skid-mounted or crated for final transport. Shipping weight shall be shown on shipping tags, together with instructions for unloading, transporting, storing, and handling on job site.
- E. Control panel components shall be industrial quality. Component schedules shown on the plans provide Manufacturer and part number references.
- F. All panels shall function as indicated in the Panel Narrative the plans.

PART 3 - EXECUTION

3.1 GENERAL

- A. Testing: Factory tests simulating operation of all of the features described in the narrative shall be performed in the presence of the Owners representative. If the panel test is to take place beyond 50 miles from Anchorage, Alaska, all expenses, including airfare and lodging for one person shall be paid for by the vendor.
- B. Control panel shall be installed in accordance with manufacturer's recommendations, including but not limited to the following:
1. The control panel shall be installed by a licensed electrician. The National Electrical Code and all applicable state and local codes shall be followed when installing this equipment. The installation shall be executed in a neat and workmanlike manner.
 2. At no time shall any individual tamper with or change any of the wiring in the control panel without the knowledge and consent of the manufacturer. The installer shall only land wires on the field terminals provided and install or remove any jumpers as shown and indicated on the control schematics to achieve proper operation. Any changes made to the panel wiring other than those just mentioned or those approved by Owner, in writing, will result in the voiding of any warranty associated with the control panel or any of the connected equipment.

3.2 COMMISSIONING

- A.** Commissioning shall be in accordance with Division 26 requirements and 26 08 00 Commissioning of Electrical and Control Systems.

END OF SECTION

SECTION 26 09 23 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. This Section includes stand-alone (non-networked) automatic lighting control devices.
 - 1. Outdoor Photocells.

1.2 RELATED SECTIONS

- A. Section 26 05 00 - Common Work Results for Electrical.
- B. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.
- C. Section 26 05 33 - Raceway and Boxes for Electrical Systems.
- D. Section 26 09 19 – Enclosed Contactors.
- E. Section 26 09 43 – Network Lighting Controls: Networked Occupancy Sensors.
- F. Section 26 27 26 – Wiring Devices: Manual Light Switches.
- G. Section 26 53 00 – Exterior Lighting

1.3 SUBMITTALS

- A. Product Data: Submit product data for all components provided that are specified in this section showing configurations, finishes, and dimensions. Each catalog sheet should be clearly marked to indicate exact part number provided, including all options and accessories.
- B. Operation and Maintenance Data: Include manufacturer's installation and troubleshooting instructions.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS – OUTDOOR PHOTOCELLS

- A. Intermatic.
- B. Tork.
- C. Substitutions: Under provisions of Division 01.

2.2 OUTDOOR PHOTOCELLS

- A. Dusk-to-dawn lighting control with a delay action.
- B. Sonic-welded polycarbonate case and lens to seal out moisture.

- C. Fully enclosed weatherproof housing.
- D. Rated 15A, 120V.
- E. Rated for mounting on exterior pole and -40°F temperature operation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install outdoor photocells on a Nema 4 enclosure and locate on the north side of the building turned away from artificial light sources, in accordance with the manufacturer's installation instructions. Do not install the photocell so that it directly faces the midday sun. Field adjust slider to turn lights On at dusk and OFF at dawn.

3.2 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
 - 1. After installing lighting control device and after electrical circuitry has been energized, test for compliance with requirements and intended operation..
- B. Lighting control devices that fail tests and inspections are defective work.

3.3 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION

SECTION 26 21 00 – LOW-VOLTAGE ELECTRICAL SERVICE ENTRANCE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Arrangement with Utility Company for permanent electric service including payment of Utility Company charges for service.
- B. Overhead service entrance.

1.2 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements and Section 26 05 00 – Common Work Results for Electrical.
- B. Section 26 05 26 – Grounding and Bonding for Electrical System.
- C. Section 26 05 33 – Raceway and Boxes for Electrical Systems.
- D. Section 26 05 53 – Identifications for Electrical Systems.
- E. Section 31 23 16.13 – Trenching.

1.3 REFERENCE STANDARDS

- A. NEMA 250 – 2003 Enclosures for Electrical Equipment (1000 Volts Maximum).
- B. UL 50 – 1995 Enclosures for Electrical Equipment.
- C. UL 414 – 1999 Standard for Meter Sockets.

1.4 SYSTEM DESCRIPTION

- A. System Voltage: 120/240 volts, single phase, three-wire, 60 Hertz.
- B. Service Entrance: Overhead.

1.5 SUBMITTALS

- A. Product Data: Submit product data for all components provided, showing electrical characteristics, material, finishes, and dimensions. Each catalog sheet should be clearly marked to indicate exact part number provided, including all options and accessories.
- B. Shop Drawings: Submit shop drawings and manufacturer's literature for self-contained meter base with circuit breaker disconnecting means.

1.6 QUALITY ASSURANCE

- A. Utility Company: Alaska Village Electric Cooperative (AVEC)
- B. Install service entrance in accordance with Utility Company's rules and regulations.

PART 2 - PRODUCTS

2.1 METERING EQUIPMENT

- A. Meter: Furnished and installed by the Utility Company.
- B. Self-Contained Meter Base: NEMA 3R rated self-contained meter socket with circuit breaker disconnecting means with safety socket feature and factory installed test-block/bypass facilities. Automatic type, slide type, horn type, screw type and lever type meter socket bypass devices are specifically prohibited. The service entry section and the meter socket shall be sealable and isolated or barriered from other integral enclosure sections to effectively prevent the attachment to un-metered conductors or terminals. Network service installations shall have a factory installed 5th jaw or factory supplied 5th jaw kit. The 5th jaw shall be located in the 9 o'clock position.
- C. Transformer Rated Meter Base: NEMA 3R [1] [4X], 13-terminal [6-terminal], transformer rated 20 amperes, 600 volts with mounting provisions to accommodate a covered test switch with test switch cover sealing provisions. The test switch mounting provisions shall accept a 10 pole covered test switch with a base dimension of 9.5 inches in width and a depth (the dimension from the rear edge of the test switch base to the top of the cover sealing stud) of no less than 3.375 inches. The lower cover of the meter socket shall seat fully with a covered test switch in place. Meet requirements of NEMA standards for watt-hour meter sockets-NEMA E117-1978 (similar to EUSERC Drawing No. 339). The utility company will furnish and install the test switch and CT wiring. [13-jaw is for three phase; 6-jaw is for single phase.]
- D. Current Transformer Cabinet: NEMA 3R [1] [4X], UL 414 listed, minimum size as shown on the drawings. All current transformer cabinets and compartments shall have hinged front cover access to the current transformers. The hinged front cover shall be lockable and shall accept a padlock with a shackle diameter of not less than 5/16 inch. Current transformer cabinets for services from 201 Amperes to 800 Amperes shall have ¼ x 20 mounting studs on the enclosure body spaced to accept a current transformer mounting base. Current transformer cabinets for services from 801 Amperes to 2,500 Amperes shall have side gutters sized as shown on the drawings and removable bus links.
- E. All removable covers for compartments containing un-metered conductors shall be sealable or lockable with sealable latches, stud and wing-nuts, sealing screws, or slot and tab devices. All top cover panels, side cover panels and rear cover panels providing access to un-metered conductors shall be secured in place with devices that cannot be loosened from the outside, screws or bolts requiring special tools for installation or removal are not acceptable alternates. No removable panel or cover requiring sealing or locking shall be located behind other panels, covers or doors except for rain-tight enclosures. Hinged cover panels shall be lockable on the side opposite the hinges. Hinged panel covers shall accept a padlock with a shackle diameter of not less than 5/16 inch. Stud and wing-nut sealing assemblies shall consist of a ¼ inch x 20 (minimum) stud and associated wing-nut, each drilled 0.0635

inch (minimum) for sealing purposes. The stud shall be securely attached so as to not loosen or back out when being fastened. Sealing screws shall be drilled 0.0635 inch (minimum) for sealing purposes. All securing screws for removable panel covers shall be captive.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Make arrangements with Utility Company to obtain permanent electric service to the Project.
- B. Overhead: Install service rack and weatherhead at height as required by Utility Company. Utility Company will connect service drop to service entrance conductors.
- C. Underground: Install service entrance conduits from Utility Company's terminal pole to service entrance equipment. Utility Company will connect service lateral conductors to service entrance conductors.
- D. Meter sockets shall be installed with the centerline of the socket opening no more than 72 inches and no less than 60 inches above finished grade. The meter socket shall be installed with a minimum 10 inches of side clearance to each side of the socket. On current transformer rated meter sockets, the conduit connecting the meter socket and the current transformer cabinet shall be rigid steel or IMC and have a minimum diameter of 1 inch, shall not be longer than 25 feet, shall have no access points (junction boxes, condulets, etc.), and shall connect to the meter socket at a factory supplied knockout located below the test switch mounting provisions.
- E. Self-contained meter sockets equipped with a 5th jaw for network service but served from a single phase, 3-wire 120/240 Volt source shall have the 5th jaw and its associated wiring removed from the socket.
- F. All service entrance equipment shall have signage for arc hazard installed. The marking shall be located to be clearly visible to qualified personnel before examination, adjustment, servicing or maintenance of the equipment. At a minimum the signage shall state the following:

Warning

Arc Flash and Shock Hazard

Appropriate PPE Required

END OF SECTION

SECTION 26 24 16 - PANELBOARDS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Lighting and Appliance Branch Circuit Panelboards.

1.2 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements, and Section 26 05 00 – Common Work Results for Electrical.
- B. Section 26 05 26 – Grounding and Bonding for Electrical Systems.
- C. Section 26 05 53 – Identification for Electrical Systems.

1.3 REFERENCES

- A. NEMA AB 1 - Molded Case Circuit Breakers.
- B. NEMA KS 1 - Enclosed Switches.
- C. NEMA PB 1 - Panelboards.
- D. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
- E. NEMA PB 2.2 - Application Guide for Ground-fault Protective Devices for Equipment.
- F. UL 50 – Enclosures for Electrical Equipment.
- G. UL 67 – Panelboards.
- H. UL 98 - Enclosed and Dead-front Switches.
- I. UL 489 – Molded Case Circuit Breakers and Circuit Breaker Enclosures.
- J. Federal Specification W-C-375B/Gen – Circuit Breakers, Molded Case, Branch Circuit and Service.
- K. Federal Specification W-C-865C - Fusible Switches.

1.4 SUBMITTALS

- A. Submit data under provisions of Division 01 and Section 26 05 00.
- B. Product Data: Submit product data for all components provided which fall under this section showing configurations, finishes, and dimensions. Each catalog sheet should

be clearly marked to indicate exact part number provided, including all options and accessories.

- C. Shop drawings: Submit shop drawings for each panelboard [load center] indicating features and device arrangement and size. Include outline and support point dimensions, voltage, main bus ampacity, and integrated short circuit ampere rating.

1.5 CLOSEOUT SUBMITTALS

- A. Project Record Drawings: Submit final record panel schedules as hardcopy and in Microsoft Excel format. Submit under Section 26 05 00.
- B. Operation and Maintenance Manuals: Provide product data and shop drawing information including replacement parts list. Provide installation, operation and maintenance information per manufacturer.
- C. Panel Schedules: Prior to Substantial Completion, submit copies of all panel schedules for review by the Owner. The Owner will note any changes to the room numbers/names and the Contractor shall provide revised typed panel schedules to reflect all changes, at no additional cost to the Owner.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site under provisions of Division 01.
- B. Upon arrival at the site inspect equipment and report on any damage.
- C. Handle carefully on site to avoid any damage to internal components, enclosures and finishes.
- D. Store in a clean, dry environment. Maintain factory packaging and provide an additional heavy canvas or plastic cover to protect enclosures from dirt, water, construction debris and traffic.

1.7 WARRANTY

- A. Manufacturer shall warrant specified equipment to be free of defects for a period of one year from the date of installation.

1.8 SPARE PARTS

- A. Keys: Furnish 2 each to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS - PANELBOARDS

- A. Square D.
- B. Cutler Hammer.
- C. General Electric.

- D. Siemens.
- E. Substitutions: Under provisions of Division 01.

2.2 BRANCH CIRCUIT PANELBOARDS

- A. Lighting and Appliance Branch Circuit Panelboards: NEMA PB 1; circuit breaker type.
- B. Enclosure: NEMA PB 1; Type 3R. Boxes shall be galvanized steel constructed in accordance with UL50 requirements. Interiors shall be field convertible for top or bottom incoming feed. Main lug interiors up to 400 amperes shall be field convertible to main breaker. Interior leveling provisions shall be provided for flush mounted applications.
- C. Cabinet Size: 6 inches deep; 20 inches wide minimum.
- D. Provide flush or surface cabinet front with concealed trim clamps, concealed hinge and flush lock all keyed alike. Finish in manufacturer's standard gray enamel.
- E. Provide panelboards with copper bus, ratings as scheduled on Drawings. Provide one continuous bus bar per phase each. Panelboards shall have sequentially phased branch circuit connectors suitable for bolt-on branch circuit breakers. Bussing shall be fully rated.
- F. Integrated Short Circuit Rating: Provide panelboards with short circuit ratings as shown on the Drawings. Minimum ratings shall be 14,000 amperes RMS symmetrical.
- G. Main/Sub Feed Circuit Breakers: NEMA AB 1; Provide vertical mount main and/or sub feed circuit breaker in panelboards as shown on the drawings.
 - 1. Circuit breakers shall be operated by a toggle-type handle and shall have a quick-make, quick-break over-center switching mechanism that is mechanically trip-free. Automatic tripping of the breaker shall be clearly indicated by the handle position. Contacts shall be nonwelding silver alloy and arc extinction shall be accomplished by means of DE-ION arc chutes. A push-to-trip button on the front of the circuit breaker shall provide a local manual means to exercise the trip mechanism.
 - 2. Lugs shall be UL Listed to accept copper and aluminum conductors and shall be suitable for 90°C rated wire, sized according to the 75 °C temperature rating per NEC Table 310-16. Lug body shall be bolted in place.
- H. Branch Circuit Breakers: NEMA AB 1; Provide panelboards with bolt-on type thermal magnetic trip circuit breakers.
 - 1. Circuit breakers shall be operated by a toggle-type handle and shall have a quick-make, quick-break over-center switching mechanism that is mechanically trip-free with common trip handle for all poles.

2. Lugs shall be UL Listed to accept copper and aluminum conductors and shall be suitable for 90°C rated wire, sized according to the 75 °C temperature rating per NEC Table 310-16. Lug body shall be bolted in place.
3. Provide circuit breakers UL listed as Type SWD for lighting circuits.
4. Provide UL Class A ground fault interrupter circuit breakers where scheduled on Drawings.

2.3 PANELBOARD IDENTIFICATION

- A. For each new panelboard provide typed schedule denoting each circuit load by the load type and final name and location.
- B. Provide panel schedule in O&M manual for every new panelboard.
- C. All panelboards load centers shall have signage for arc hazard installed. The marking shall be located to be clearly visible to qualified personnel before examination, adjustment, servicing or maintenance of the equipment. At a minimum the signage shall state the following:

Warning

Arc Flash and Shock Hazard

Appropriate PPE Required

2.4 TRANSIENT VOLTAGE SURGE SUPPRESSOR

- A. Integral Surge Suppressor:
 1. The manufacturer of the TVSS shall be the same as the manufacturer of the distribution equipment in which the devices are installed and shipped. Also, this distribution equipment shall be fully tested and certified to UL 67 standards.
 2. Component recognized in accordance with UL 1449 and UL 1283.
 3. Independently tested with category C3 high exposure waveform (20 kV-1.2/50us, 10kA-8/20 us) per IEEE C62.41.
 4. Furnish copper bus bars for surge current path.
 5. Construct using surge current modules (MOV based). Each module fused with user replaceable 200,000 AIR rated fuses. Status of each module monitored on front cover of panelboard enclosure and on module.
 6. Furnish with audible alarm activated when one of surge current modules has failed. Furnish alarm on/off to silence alarm and alarm push-to-test switch to test alarm. Locate switches and alarm on front cover of panelboard enclosure.

7. Meet or exceed the following criteria:
 - a. Minimum surge current rating shall be 160 kA per phase (80 kA per mode) for service entrance and 80 kA per phase (40 kA per mode) for distribution applications.
 - b. Pulse Lift Test: Capable of protecting against and surviving 5000 IEEE C62.41 Category C transients without failure or degradation.
 - c. UL 1449 clamping voltage must not exceed the following:

<u>VOLTAGE</u>	<u>L-N</u>	<u>L-G</u>	<u>N-G</u>
240/120	800/400V	800/400V	400V

8. Furnish response time no greater than five nanoseconds for individual protection modes.
9. Designed to withstand maximum continuous operating voltage (MCOV) of not less than 115 percent of nominal RMS voltage.
10. Furnish visible indication of proper suppresser connection and operation. Lights indicate operable phase and module.
11. Furnish minimum EFI/RFI filtering of 34 dB at 100 kHz with insertion loss ratio of 50: 1 using Mil Std. 220A methodology.

B. Panelboard Mounted:

1. UL 67 listed and TVSS device UL 1449 Component Recognized. TVSS device meets UL 1449. Furnish panelboard markings with clamp voltage at TVSS terminals and clamp voltage at panelboard line terminals.
2. Construct box of galvanized steel. Box size as indicated on Drawings.
3. Main bus constructed of copper and rated for load current.
4. Furnish interior with branch circuit breakers if not bus mounted type. Furnish [one] [60] amp circuit breaker for each TVSS, with appropriate number of poles, as dedicated disconnect for TVSS.
5. Furnish with insulated ground bus and safety ground bus.

C. Enclosure Mounted:

1. UL 67 listed and TVSS device UL 1449 Component Recognized. TVSS device meets UL 1449.
2. Provide with [flush] [surface] mounted NEMA Type 4X enclosure. Construct box of galvanized steel. Box size as required for TVSS unit and in compliance with NFPA 70.

3. Provide panelboard mounted circuit breakers with appropriate number of poles and manufacturer required ampacity, as dedicated disconnect for TVSS.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install panelboards plumb and flush in conformance with NEMA PB 1.1.
- B. Height: 6 feet, 6 inches to top of panelboard.
- C. Provide filler plates for unused spaces in panelboards.
- D. Panel Schedules: Revise schedules to reflect circuiting changes required to balance phase loads.

3.2 FIELD QUALITY CONTROL

- A. Measure steady state load currents at each panelboard feeder. Should the difference at any panelboard between phases exceed 20 percent, rearrange circuits in the panelboard to balance the phase loads within 20 percent. Take care to maintain proper phasing for multi-wire branch circuits.
- B. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers.

END OF SECTION

SECTION 26 27 16 – ELECTRICAL CABINETS AND ENCLOSURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Hinged Cover Enclosures.
- B. Cabinets.
- C. Terminal Blocks and Accessories.

1.2 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements, and Section 26 05 00 – Common Work Results for Electrical.
- B. Section 26 05 26 – Grounding and Bonding for Electrical Systems.
- C. Section 26 05 33 – Raceway and Boxes for Electrical Systems.
- D. Section 26 05 53 – Identification for Electrical Systems.

1.3 REFERENCES

- A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- B. ANSI/NEMA ICS 1 - Industrial Control and Systems.
- C. ANSI/NEMA ICS 4 - Terminal Blocks for Industrial Control Equipment and Systems.
- D. ANSI/NEMA ICS 6 - Enclosures for Industrial Control Equipment and Systems.

1.4 SUBMITTALS

- A. Submit product data under provisions of Division 01.
- B. Shop Drawings for Equipment Panels: Include wiring schematic diagram, wiring diagram, outline drawing and construction diagram as described in ANSI/NEMA ICS 1.

PART 2 - PRODUCTS

2.1 HINGED COVER ENCLOSURES

- A. Construction: NEMA 250; 4X stainless steel.
- B. Finish: Manufacturer's standard enamel finish.
- C. Covers: Continuous hinge, held closed by flush latch operable by key.

- D. Panel for Mounting Terminal Blocks or Electrical Components: 14 gauge steel, white enamel finish.

2.2 CABINETS

- A. Cabinet Boxes: Galvanized steel with removable endwalls,. Provide $\frac{3}{4}$ inch thick marine grade plywood backboard for mounting terminal blocks.
- B. Cabinet Fronts: Steel, surface type with concealed trim clamps, concealed hinge and flush lock keyed to match branch circuit panelboard; finish in gray baked enamel.

2.3 TERMINAL BLOCKS AND ACCESSORIES

- A. Terminal Blocks: ANSI/NEMA ICS 4; UL listed.
- B. Power Terminals: Unit construction type, closed-back type, with tubular pressure screw connectors, rated 600 volts.
- C. Signal and Control Terminals: Modular construction type, channel mounted; tubular pressure screw connectors, rated 300 volts.

2.4 FABRICATION

- A. Shop assemble enclosures and cabinets housing terminal blocks or electrical components in accordance with ANSI/NEMA ICS 6.
- B. Provide conduit hubs on enclosures.
- C. Provide protective pocket inside front cover with schematic diagram, connection diagram, and layout drawing of control wiring and components within enclosure.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install cabinets and enclosures plumb; anchor securely to wall and structural supports at each corner, minimum.
- B. Install trim plumb.

END OF SECTION

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Switches.
- B. Receptacles.
- C. Device Plates and Box Covers.

1.2 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 01 - General Requirements and Section 26 05 00 – Common Work Results for Electrical.
- B. Section 26 05 26 – Grounding and Bonding for Electrical Systems.
- C. Section 26 05 33 – Raceway and Boxes for Electrical Systems.
- D. Section 26 05 33.16 – Boxes for Electrical Systems.
- E. Section 26 05 53 – Identification for Electrical Systems.

1.3 REFERENCE STANDARDS

- A. FS W-C-596 – Federal Specification for Electrical Power Connector, Plug, Receptacle, and Cable Outlet.
- B. FS W-S-896 – Federal Specification for Switches, Toggle (Toggle and Lock), Flush Mounted.
- C. NEMA WD 1 - General Color Requirements for Wiring Devices.
- D. ANSI/NEMA WD 6 – Wiring Devices – Dimensional Requirement.
- E. UL 20 – General-Use Snap Switches.
- F. UL 943 – Ground-Fault-Circuit-Interrupters.

1.4 SUBMITTALS

- A. Product Data: Submit product data for all components provided that are specified in this section showing configurations, finishes, and dimensions. Each catalog sheet should be clearly marked to indicate exact part number provided, including all options and accessories.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - WALL SWITCHES

- A. Hubbell.
- B. Leviton.
- C. Pass & Seymour.
- D. Arrow Hart
- E. Substitutions: Under provisions of Division 01.

2.2 SWITCHES

- A. Switches for Lighting Circuits: UL 20; ANSI/NEMA WD-6; and Federal Specification FS W-S-896 AC industrial grade snap switch with toggle handle, rated 20 amperes and 120-277 volts AC.
- B. [Pilot Light Type: UL 20; ANSI/NEMA WD-6; and Federal Specification FS W-S-896 AC industrial grade snap switch, rated 20 amperes and 120-277 volts AC. Handle: Red pilot light toggle (illuminated when load is on). Provide single pole unless otherwise indicated on Plans.]

2.3 ACCEPTABLE MANUFACTURERS - RECEPTACLES

- A. Hubbell.
- B. Leviton.
- C. Pass & Seymour.
- D. Arrow Hart
- E. Substitutions: Under provisions of Division 01.

2.4 RECEPTACLES

- A. GFCI Receptacles: ANSI/NEMA WD-6; 20A, duplex convenience receptacle with integral class 'A' ground fault current interrupter, LED indicator lamp and integral lockout.
- B. Weather-Resistant Receptacles: ANSI/NEMA WD-6; Listed to the weather-resistant supplement of UL498 and complying with the requirements of NEC 406.9.

2.5 DEVICE PLATES

- A. Weatherproof Cover Plate: UL listed, cast aluminum, hinged outlet cover/enclosure, with gasket between the enclosure and the mounting surface, suitable for wet locations while in use and identified as "Extra Duty" per NEC 406.9 (B)(1).
- B. Exposed Work Cover Plate: ½ inch raised, square, pressed, galvanized or cadmium plated steel cover plate supporting devices independent of the outlet box.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install wall switches at height and location as indicated on Drawings.
- B. Install receptacles at height and location as indicated on Drawings.
- C. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface-mounted outlets.
- D. Install devices and plates flush and level.
- E. Ground receptacles to boxes with a grounding wire. Grounding through the yoke or screw contact is not an acceptable alternate to the ground wire.
- F. Install circuit label on each receptacle and light switch in accordance with Section 26 05 53.

END OF SECTION

SECTION 26 50 00 – LIGHTING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Exterior Luminaires and Accessories.

1.2 RELATED SECTIONS

- A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under General Conditions of the Contract General Requirements, and Section 26 05 00 – Common Work Results for Electrical.
- B. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables.
- C. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
- D. Section 26 05 29 - Hangers and Supports for Electrical Systems: General Supports for Luminaires.
- E. Section 26 05 33 – Raceway and Boxes for Electrical Systems.
- F. Section 26 05 53 – Identification for Electrical Systems.
- G. Section 26 09 19 – Enclosed Contactors.
- H. Section 26 27 26 – Wiring Devices.

1.3 DEFINITIONS

- A. CCT: Correlated Color Temperature.
- B. CRI: Color Rendering Index.
- C. Driver: LED Power Supply.
- D. Fixture: See "Luminaire."
- E. IES: Illuminating Engineering Society of North America
- F. IP: International Protection or Ingress Protection Rating.
- G. Lamp Module: Replaceable LED board array/light engine including a plug-in connector.
- H. LED: Light-emitting diode.
- I. Lumen: Measured output of lamp and luminaire, or both.

- J. Luminaire: Complete lighting unit, including lamp or lamp module, driver, reflector, and housing.

1.4 REFERENCE STANDARDS

- A. IES TM-21-11 Projecting Long Term Lumen Maintenance of LED Light Sources.
- B. IES LM-80 IES Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules.

1.5 SUBMITTALS

- A. Product Data: Submit the following:
 - 1. Luminaires: Include manufacturer's product data sheets and/or shop drawings including outline drawings showing support points, weights, and accessory information for each luminaire type. Clearly indicate all options being provided. Arrange data for luminaires in the order of fixture designation.
 - 2. Prior to preparing submittals, coordinate with the reflected ceiling plan for ceiling finishes and provide all necessary kits, brackets, stems, trim, etc. to install the specified fixtures in the ceilings provided. Clearly note these configurations on the product data sheets.
- B. Shop Drawings: Provide detailed shop drawings for specialty luminaires as required by the manufacturer.
- C. Warranty: Provide copies of manufacturer's warranty information for each luminaire. If warranty information is the same for a group of manufacturer's luminaires, provide a letter or schedule clearly indicating what warranty applies to each fixture.

1.6 CLOSEOUT SUBMITTALS

- A. Project Record Drawings: Indicate actual locations and mounting heights of all lighting fixtures and accessories on the project record drawings. Update part numbers and description on the Lighting Fixture Schedule to match the actual luminaires installed. Submit under Section 26 05 00.
- B. Operation and Maintenance Manuals:
 - 1. Provide recommended luminaire cleaning and re-lamping schedule. If any luminaire lenses require special lubricants for cleaning, include this in the schedule.
 - 2. Provide detailed bill of materials for all items purchased in this section including distributor's contact name, phone number and pertinent information.
 - 3. Provide luminaire manufacturer's installation instructions.
 - 4. Provide manufacturer's step-by-step installation instructions showing how to replace the LED lamp modules and drivers for each luminaire.

5. Include any specific warranty information provided by the manufacturer for luminaires, LED boards, and drivers.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site, store and protect in a clean, dry environment under provisions of General Conditions of the Contract.

1.8 EXTRA MATERIALS

- A. Provide spare parts under provisions of Division 01.
- B. LED Luminaire: Where the specified or substitute luminaire does not have a replaceable lamp or lamp module, provide two spare luminaire per size and type installed.

PART 2 - PRODUCTS

2.1 EXTERIOR LUMINAIRES AND ACCESSORIES

- A. Luminaires: Provide UL listed luminaires as scheduled on the drawings or as approved equal.
- B. Listing: Luminaires shall be listed for use in the environment in which they are installed. For example, in hazardous, wet, damp, or corrosive locations shall be UL listed for such application.
- C. Accessories: Provide all mounting kits, supports, interconnecting wiring, power supplies, trim kits, gaskets, etc. for a complete installation.
- D. Housing:
 1. Metal parts shall be free of burrs and sharp corners and edges. Form and support to prevent warping and sagging.

2.2 LAMP MODULES – LED

- A. All LED's shall be nominal 4000 degrees Kelvin (nominal) within a 3-step MacAdam Ellipse unless special circumstances require a different color temperature application, see Luminaire Schedule on Plans.
- B. Color Rendering: Minimum CRI as scheduled on the Plans for each fixture. Under no circumstances shall the CRI be less than 70.
- C. Lamp Life: Minimum lamp life shall be calculated in accordance with IES LM-80. Lamp life for each luminaire shall be equal or greater than scheduled on the Plans. Under no circumstances shall an outdoor luminaire have a minimum rated life (L70) less than 75,000 hours at 40 degrees F average outdoor ambient temperature.
- D. Replaceable: Unless otherwise scheduled, all LED modules shall be field replaceable with quick disconnect connections.

- E. Luminaires and lamps installed outdoors shall be rated for starting and operating at a minimum of -40F.

2.3 DRIVERS - LED

- A. LED Driver: Provide UL listed power supply as recommended by the LED fixture manufacturer for operation of the specified LED lamps. Power supply shall be integral to the luminaire unless otherwise noted on the Plans. Power supply shall be dual voltage (120/277V) where available or operate at the supply voltage indicated on the Plans.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Unless otherwise noted on Plans, provide drivers integral to luminaires, pre-wired and installed at the factory, suitable for use with the selected LED lamps.
- B. Provide luminaire disconnecting means in the wiring compartment of each luminaire. Where the luminaire is fed from a multi-wire branch circuit, provide multi-pole disconnect to simultaneously break all supply conductors to the ballast, including the grounded conductor.

3.2 RELAMPING

- A. Re-lamp or replace luminaires that have failed lamps at completion of work.

3.3 ADJUSTING AND CLEANING

- A. Align luminaires and clean lenses and diffusers at completion of work. Clean dirt and debris from installed luminaires.
- B. Touch up luminaire finish at completion of work.

END OF SECTION

SECTION 31 11 00

CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. This item consists of furnishing all labor, equipment, supplies, and material in performance of all operations required for site clearing, grubbing and clean-up operations.

1.2 RELATED REQUIREMENTS

- A. Section 31 23 19 Dewatering and Control of Surface Water.
- B. Section 31 23 00 Excavation and Fill.

1.3 DEFINITIONS

- A. Clearing: Includes cutting all brush, trees and stumps, to within 6 inches of natural ground, chipping and disposing of the cuttings. Clearing also includes the removal of all snow and ice in the project area.
- B. Grubbing: Includes the removal and disposal of all stumps, roots, organics, buried logs, brush and other objectionable material or debris not otherwise indicated to remain.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.1 GENERAL

- A. Contractor shall perform all clearing and grubbing operations where designated on the Contract Drawings and as specified herein or as directed by the owner.
 - 1. Locate, identify and protect utilities from damage.
 - 2. Verify with the Owner any vegetation to remain.
- B. The project site contains miscellaneous debris including old dispensers, inoperable construction equipment, construction material, an existing fuel tank and containment area, and other debris. Contractor must coordinate with the appropriate owner or governing authority as necessary to relocate all materials, waste, and equipment that interfere with proposed improvements to approved offsite location.

3.2 PROTECTION

- A. Provide protection as necessary to prevent damage to existing improvements and utilities indicated to remain.
 - 1. Protect improvements on adjoining properties and on project site.
 - 2. Protect trees, plant growth and features designated to remain. Protect survey benchmarks, property corners, survey monuments and existing work from damage or displacement.
- B. All property corners, benchmarks or other permanent survey marker disturbed during construction shall be removed and recorded. The contractor shall be responsible for the resurvey and resetting of any disturbed property corners, benchmarks or other permanent survey markers by a professional land surveyor, licensed by the State of Alaska.

3.3 USE AND DISPOSAL OF GRUBBED MATERIAL

- A. Cleared and grubbed material shall be disposed of at a Contractor furnished disposal area.
- B. Except as otherwise stated, the Contractor shall make his/her own arrangements and assume all cost in connection with disposal sites. Disposal sites shall be located and maintained in such a manner as to prevent a public nuisance.
- C. If the disposal site is located on private land, the Contractor shall obtain written permission from the property owner or owners for such disposal sites and shall furnish the Project Manager with a copy of this permission. The written permission shall specifically provide that the property owner will not hold the Authority, its employees, agents, or engineers liable for use or damage to this property. The Contractor shall be held liable for any trespass and property damage incurred outside of the disposal site.

END OF SECTION

SECTION 31 23 00
EXCAVATION AND FILL

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. This item consists of furnishing all labor, equipment, supplies, and material in performance of all earthwork operations including construction of access road(s), tank farm & dispensing pad(s), permanent laydown area, and bulk transfer area.
- B. Important Notes:
 - 1. Contractor shall make his own determination of the adequacy of the site to support equipment and other construction loads. Additional fill material and/or crane mats may be required to support loads during construction and Contractor shall provide additional fill and/or crane mats as required at no additional cost to the Owner.

1.2 RELATED REQUIREMENTS

- A. Division 01 Specifications.
- B. Section 02 32 00 Geotechnical Investigations.

1.3 QUALITY CONTROL ASSURANCE

- A. Testing Procedures and Methods:
 - 1. Moisture-Density test standard: ASTM D1557 or AASHTO T-180, Method D.
 - 2. In-place Density Determination: Nuclear Method ASTM D2922 or AASHTO T-238.
 - 3. Gradation Analysis: ATM T-7, ASTM C136 or AASHTO T-27.
 - 4. Other testing procedures and methods referenced in individual specification sections.
- B. Quality Control Monitoring:
 - 1. Contractor shall secure and pay for all required quality control monitoring. Contractor shall utilize Project Manager approved, certified, independent laboratory and field personnel for all required testing.
 - 2. Provide certified test results as required in Section 1.04, Submittals.

3. Fill material placed prior to Project Manager Approval of test results is at the sole risk of the Contractor. Material not meeting requirements shall be removed and replaced at Contractor's expense.
- C. Minimum testing requirements are indicated below.
1. Moisture Density and Gradation Analysis:
 - a. Classified Fill: Two (2) samples shall be taken at each Classified Fill material source to be used in the work. One (1) additional sample shall be taken when any change in material occurs which, in the opinion of the Engineer, may significantly affect the optimum moisture content or maximum laboratory dry density.
 - b. If laboratory tests indicate that the fill material does not meet the specification requirements, the Contractor shall provide additional certified tests for alternative fill material sources at no additional cost to the Owner.
 2. In-Place Density:
 - a. One (1) test for every 200 cy of embankment fill placed (Minimum of one test per lift is required regardless of fill quantity).
 - b. The results of each density test shall be recorded on a test sheet. The following information shall be recorded.
 - 1) Horizontal and vertical location.
 - 2) Density and percent of referenced standard compaction.
 - 3) Material description and appropriate compaction control standard.
 - c. If test results indicate insufficient compaction, Contractor shall cease placement of fill and provide additional compaction effort and/or moisture conditioning until subsequent in-place density testing indicates proper compaction has been achieved.
 - d. All costs associated with additional in-place density testing as a result of failed tests shall be borne by the Contractor.

1.4 SUBMITTALS

- A. Submittals shall be made in accordance with the General Conditions, Division 1, and this Section.
- B. Provide the following submittals:
 1. Name of proposed independent certified testing laboratory and field testing sub-consultant.
 2. Format of proposed laboratory and field test forms.
 3. Laboratory results of gradation and moisture density tests for each fill type to be used on the project.

4. If the Contractor changes the source and/or stockpile from which materials are obtained, Gradation Analysis and Moisture-Density test reports for these new sources shall be submitted to the Project Manager.
 5. Results of all in-place density field tests.
 6. Catalog and manufacturer's data sheets for proposed compaction equipment.
 7. Disposal plan for unusable excavation.
- C. Additional Testing:
1. All testing necessary for the Contractor to locate acceptable sources of classified or unclassified fill material for the project shall be provided by the Contractor at no additional cost to the Owner.
 2. During construction, the owner may elect to have further gradation and compaction testing completed on the materials being furnished by the Contractor. This testing shall be at the expense of the Owner. The Contractor shall provide material samples as may be necessary to complete this testing and these material samples shall be furnished from material available on the Project site or from the Contractor's source and/or supplier.

1.5 MATERIAL SOURCES

The base bid assumes the Contractor will use imported material to construct the co-located tank farm. See 01 11 13 Work Covered by Contract for additional information.

- A. It is the responsibility of the contractor to select a material source for the project and supply material that meets the requirements for Classified Fill materials.
- B. The Contractor shall coordinate as necessary with the borrow pit surface and subsurface property owners, shall acquire all necessary permits and/or material sales agreements, and shall pay all required fees, royalties, and other costs associated with pit access and material extraction.
- C. The Contractor shall be responsible for all costs associated with locating, procuring, transporting, testing, storing, placing and compacting fill material for the work. The Owner is not responsible for fill lost during transportation.

PART 2 - PRODUCTS

2.1 UNCLASSIFIED EXCAVATION

- A. Excavation from the project area shall be considered unclassified. Complete all excavation regardless of the type, nature or condition of the materials

encountered as shown on the drawings and/or at the Project Manager's direction.

- B. Excavation conforming to the specifications for Classified Fill Materials may be reused. Unclassified excavation intended for reuse shall be stockpiled and tested prior to placement in the work.
- C. Dispose of unusable excavation at a location provided by Contractor and approved by Owner.

2.2 CLASSIFIED FILL MATERIALS

- A. Fill Material shall meet the requirements for Classified Fill material listed below.
- B. Classified Fill:

- 1. Type I classified fill material (aka Bethel Sand):

Earth consisting of non-plastic silt, sand, gravel, fractured rock or combinations thereof; and containing no lumps, muck, peat, frozen material, roots, sod, organic matter, or other deleterious matter; and meeting the following gradation:

<u>U.S. Standard Sieve Size</u>	<u>Percent Passing, by Weight</u>
4 inch	100
2 inch	85-100
6 inch	100
No. 4	20-60
No. 200	0-35

- 2. Type II classified fill:
material shall meet the requirements of ADOT&PF Subbase "B" material, with the exception that up to 10% fines are allowed (passing the 200 sieve). Place and compact material as described in Part 3.
- 3. Rip-Rap/Armor Rock classified fill:
Material shall be crushed/blasted consisting of sound, tough, durable rock of uniform quality and shall meet the following requirements:
 - At least 85% larger than 3" but less than 12"
 - At least 50% larger than 6"
 - Materials smaller than 3" consisting predominantly of rock spalls and shall be free of soil
- 4. Pipe Bedding Material or leveling coarse:
Material shall meet the requirements of ADOT&PF Aggregate for Surface Course "D1" and shall consist of earth, sand, gravel, rock, or

combinations thereof containing no muck, peat, frozen material, roots, sod, or other deleterious matter and is compactable as described.

PART 3 - EXECUTION

3.1 GENERAL

- A. Safety – The Contractor shall be solely responsible for making all excavations in a safe manner. Provide appropriate measures to retain excavation sideslopes and prevent sloughing to ensure that persons working in or near the excavation are protected.
- B. Notify Project Manager of any discrepancies between Contractual requirements and site conditions prior to start of Work.
- C. Maintain subgrade, backfill and embankment areas or lifts open until testing is complete and testing requirements are met, or approval of testing is secured from the Project Manager.
- D. Any work covered up prior to test completion and achieving testing requirements or Project Manager's approval shall be excavated and reconstructed at Contractor's expense.
- E. Work in inclement weather is at Contractors risk. Any materials which become unstable as the result of improper moisture content, improper selection of techniques, equipment, or operations during inclement wet weather shall be replaced at Contractor's expense.
- F. Excavations and embankment shall be accomplished in such a manner that drainage is maintained at all times; any areas not so drained shall be kept free of standing water by pumping if necessary.
- G. The Contractor shall provide for the proper maintenance of traffic flow and accessibility as may be necessary, and shall also make adequate provisions for the safety of property and persons.
- H. No separate payment for any excavation shall be made. All excavation shall be incidental to the Bid Item being performed.

3.2 EXCAVATION

- A. Excavate to lines and grades shown on the Contract Drawings. Remove and dispose of all topsoil, dirt, muck, frozen chunks, clay balls, roots, organic material, debris, or deleterious material.
- B. At Contractor's option, unclassified excavation may be stockpiled and tested for conformance with classified fill specifications. See Part 1 of this specification for testing requirements.

- C. Disposal of Excess Excavation:
 - 1. Dispose of all excess excavated materials offsite. Contractor shall make arrangements for the disposal of the excavated material and bare all costs incidental to such disposal.
 - 2. Sideslopes of excavation waste piles shall be sloped to match the materials natural angle of repose, or flatter.
 - 3. Excavation waste areas shall be completely within the limits of the disposal area property.
- D. Dewatering:
 - 1. Excavate all materials in a dewatered condition unless approved otherwise by the Project Manager.
 - 2. Dewatering shall be performed in accordance with the requirements of Section 31 23 19, Dewatering and Control of Surface Water.
- E. Unauthorized Excavation:
 - 1. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or neat-line dimensions without written direction by the Project Manager.
 - 2. Unauthorized excavation, as well as remedial work as directed, shall be at Contractor's expense.
 - 3. Backfill and compact unauthorized excavations as specified for authorized excavations of same classification.

3.3 SITE PREPARATION

- A. Clear and grub the construction area in accordance with Section 31 11 00 of the Specifications and the Contract Drawings. Remove all organic material, silt, and top soil and dispose at a location provided by the Contractor.
- B. Project area must be fully thawed (no seasonal frost) prior to placement of fill.
 - 1. Prior to placement of fill Contractor shall demonstrate that ground is frost free by excavating a minimum of three test pits evenly spaced over the project area.
 - 2. Minimum test pit depth shall be 8 feet.
 - 3. If frozen soils are encountered, the Project Manager shall be notified and the test pit shall be filled. At the discretion of the Project Manager additional time shall be allowed for the ground to thaw. Subsequent test pits shall be dug a minimum of 10 ft horizontal from previous pits.

- C. Fill all depressions or holes below the general area surface level, whether caused by test pits, removal of debris or unacceptable material, or otherwise. Fill with Classified material as shown on the drawings, and compact to specified density and to a level, uniform surface before the placement of subsequent layers.
- D. Sloped ground surfaces steeper than 1 vertical to 4 horizontal on which embankment is to be placed shall be plowed, benched, or broken up in such manner that the fill material will bond with the prepared surface.

3.4 EMBANKMENT CONSTRUCTION

- A. Embankment Fill Placement:
 - 1. The specified material shall be placed at the locations and to the lines and grades indicated on the Contract Drawings. The material shall be placed and spread uniformly in successive layers not exceeding eight (8) inches in loose thickness. The Project Manager may approve lifts of greater thickness provided the equipment and method used will consistently achieve the specified density. The layers shall be carried up full width from the bottom of the fill to avoid the necessity of widening the edges after the center has been brought to grade. Each layer shall be compacted in accordance with Section 3.05 of this Specification.
 - 2. Blading, rolling, and tamping shall continue until the surface is smooth, free from waves and irregularities, and conforms to elevations shown on the Contract Drawings. If at any time the material is excessively wet; it shall be aerated by means of blade graders, harrows, or other suitable equipment until the moisture content is satisfactory. The surface shall then be compacted and finished as specified above.
 - 3. Oversized material shall be removed. Portions of any layer in which the embankment material becomes segregated shall be removed and replaced with satisfactory material or shall be added to and remixed to secure proper gradation as directed by the Project Manager. No separate payment will be made for any material removed or regraded in areas where material becomes segregated.

3.5 COMPACTION

- A. Compact each embankment lift to 95% of maximum density at optimum moisture content as determined by ASTM D1557 or AASHTO T-180, Method D.
- B. Correct improperly compacted areas or lifts if soil density tests indicate inadequate compaction.
- C. Portions of any lift in which the materials become segregated to the extent that the required percent compaction cannot be attained, shall be removed by the Contractor and replaced with satisfactory materials, or blended with

additional material until segregation is eliminated and specified percent compaction is attained.

- D. If, in the opinion of the Project Manager, based on testing service reports and inspection, subgrade and layers of embankment that have been placed are below specified density, the Contractor shall perform additional compaction and testing at elevations directed by the Project Manager until specified density is obtained, at no additional cost to the Owner.
- E. The Contractor shall be responsible for providing the proper size and type of compaction equipment and for selecting the proper method of operating said equipment to attain the required compaction density.

3.6 GRADING

- A. Existing ground contours shown on the Contract Drawings are based upon limited survey information and are approximate.
- B. Finished surfaces shall be not more than 0.10 foot above or below the finished grade elevations shown on the Contract Drawings; soft spots or settling areas shall be corrected at Contractor's expense. Feather finish grades to match adjacent existing roads and parking surfaces where required.

3.7 MAINTENANCE

- A. As necessary, Contractor shall water the site while grading is in progress to control dust.
- B. Contractor shall protect newly graded areas from traffic and erosion and keep free of trash and debris.
- C. Contractor shall repair and re-establish grades in settled, eroded and rutted areas as directed by the Project Manager.
- D. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.
- E. All open excavations shall be adequately signed and barricaded to protect the public.

3.8 DENSITY TEST RECORD DOCUMENTATION

- A. The results of each density test shall be recorded on a test sheet. The following information shall be recorded.
 - 1. Horizontal and vertical location.
 - 2. Density and percent of referenced standard compaction.
 - 3. Material description and appropriate compaction control standard.

END OF SECTION

SECTION 31 23 19
DEWATERING AND CONTROL OF SURFACE WATER

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. This Section describes the requirements for dewatering and the control of surface water during construction.

1.2 SYSTEM DESCRIPTION

- A. Dewatering and temporary diversion works shall be designed by and be the sole responsibility of the Contractor.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Selection of equipment and materials to perform the work is at the option of the Contractor.

PART 3 - EXECUTION

3.1 GENERAL

- A. Contractor shall make his own provisions for diverting surface run off, alleviating ponding water, and dewatering excavation when ground water is encountered.
- B. Contractor shall be responsible for coordinating, acquiring, and paying for all permits required for dewatering operations.
- C. Remove ponded water and limit water flowing or infiltrating into the work area to the extent that the quality of work is not compromised.
- D. Surface water flows within the work area shall be diverted by constructing temporary ditches, berms, or other means to control and direct the water away from the work; use of pumping equipment may be required to dewater some areas.
- E. Discharge from dewatering operations shall be returned to natural drainage routes. Settling pits, silt fences, straw dikes, or other appropriate measures shall be taken to prevent highly turbid waters from entering existing ponds, streams, or wetlands.

END OF SECTION

SECTION 31 23 33

TRENCHING AND BACKFILL FOR UTILITIES

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. The Work under this item includes furnishing all labor, materials and equipment to perform all operations pertaining to trenching and backfill for utilities.

1.2 RELATED REQUIREMENTS

- A. Section 31 23 00 - Excavation and Fill
- B. Section 33 52 13 – Liquid Fuel Piping
- C. Section 26 00 00- Electrical Methods and Materials

1.3 PROTECTION

- A. Protect equipment and vehicular traffic from trenches and excavations by providing adequate barricades and signage.
- B. Protect excavation side-slopes or adjacent structures by providing adequate back-slopes, shoring, bracing or other methods required to prevent failure of the excavation or existing soils.
- C. Protect all above and belowground utilities.
- D. Notify the Project Manager of unexpected sub-surface conditions and discontinue work in affected areas until notification is given to resume work.
- E. Grade top perimeter of the excavation to prevent surface water runoff from entering the excavation.
- F. Provide for dewatering of the trench where ground water is encountered.

1.4 QUALITY CONTROL ASSURANCE

- A. Moisture-Density test standard: ASTM D1557 or AASHTO T-180, Method D.
- B. In-place Density Determination: Nuclear Method ASTM D2922 or AASHTO T-238.
- C. Quality control monitoring of trench backfill materials and construction by certified independent laboratory approved by Owner, secured and paid for by the Contractor.
- D. Minimum frequency for testing is indicated below. Additional testing may be necessary depending on field conditions

1. Moisture Density and Gradation Analysis on Classified and Unclassified Materials: One (1) sample for approval, prior to use, plus one (1) additional sample when any change in material occurs which, in the opinion of the Project Manager, may significantly affect the optimum moisture content or maximum laboratory dry density.
2. In-Place Density – Trench Backfill:
 - a. One (1) test per lift for every 200 lineal feet of trench.

1.5 SUBMITTALS

- A. Moisture-Density test reports for backfill material from qualified testing laboratory.
- B. In-place density test results in approved format.
- C. If the Contractor changes the source and/or stockpile from which materials are obtained, Gradation Analysis and Moisture-Density test reports for these new sources shall be submitted to the Project Manager.
- D. The Contractor shall make allowances in his Bid for these items to cover expenses incurred for certified testing and no additional compensation will be allowed.

PART 2 – MATERIALS

2.1 TRENCH BACKFILL

- A. Material for trench backfill shall be obtained from the trench excavation.
- B. If the excavated material is unsuitable for trench backfill (contains organic matter, muck, peat, frozen materials, vegetation, debris or other unsuitable or deleterious matter), the Project Manager may direct the Contractor to furnish Classified Fill material.

2.2 LOCATOR/WARNING TAPE

- C. Metallic Locator/Warning tape shall be capable of being inductively detected electronically. Tape shall be as manufactured by Lineguard, Inc., Wheaton, Illinois, (708)-653-0271, Reef Industries, Inc., Houston, Texas, (713)-943-0070, or approved equal. Materials shall conform to the following:
 1. Film: Inert plastic. Each film layer shall be not less than 0.0005-inch thick (0.5 mil).
 2. Imprint: 3/4-inch or larger bold black letters.
 3. Legend: The buried utility line tape shall be identified with imprint such as "Caution: Water Line Below" and the identification repeated on approximately 24-inch intervals.

4. Metallic foil laminated between two layers of impervious plastic film not less than 2 inches wide. The adhesive shall be compatible with the foil and film. Total thickness of tape shall not be less than 0.005 inch (5 mil).

PART 3 – EXECUTION

3.1 PREPARATION

- A. Identify all existing underground utilities. Stake and flag their locations.
- B. Maintain and protect the existing utilities that may pass through the work area. The Contractor shall coordinate with AVEC, the City, and the local utility company before excavating near utility poles. Temporary bracing of poles and the relocation of poles or guy-anchors shall be as directed by the utility company and approved by the Project Manager.

3.2 EXCAVATION

- A. Excavate the subsoil required for installing piping and conduits.
- B. Cut trenches sufficiently wide to enable proper installation and inspection of utilities as specified and shown on the Contract Drawings.
- C. Remove and dispose of all organic material and debris from trench excavation.
- D. Correct unauthorized excavation or over-excavated areas at no cost to the Owner.

3.3 DISPOSAL SITES

- A. Except as otherwise stated, the Contractor shall make his/her own arrangements and assume all costs in connection with disposal sites. Disposal sites shall be located and maintained in such a manner as to prevent a public nuisance.
- B. If the disposal site is on private property, the Contractor shall obtain written permission from the property owner or owners for such disposal sites and shall furnish the Authority with a copy of this permission. The written permission shall specifically provide that the property owner will not hold AVEC, its employees, agents, or engineers liable for use of or damage to this property. The Contractor shall be held liable for any trespass or property damage incurred outside of the disposal site.

3.4 TRENCH BACKFILL

- A. The first lift is to provide at least a 6-inch bedding thickness under the pipeline and shall be placed before the pipe is laid in the trench. Subsequent lifts of not more than 8-inches shall be installed and individually compacted to 95% of maximum density as described in Section 31 23 00 Excavation and Fill, of these Specifications.
- B. No blocking of any type shall be used to adjust the pipe to grade.

- C. Where ground water is present, the Contractor shall provide drainage through pumping or ditching to ensure that the bedding does not become saturated before placement of the backfill material.
- D. The Contractor shall exercise caution when compacting above pipes to ensure that the pipes and coatings are not damaged by compaction and backfilling operations. All pipes or coatings damaged during backfill or compaction operations shall be repaired or replaced by the Contractor, at no expense to the Owner.

3.5 FIELD QUALITY CONTROL

- A. Notify the Project Manager at least 24 hours in advance of trench backfilling operations to allow for inspection. Failure to obtain inspection prior to placement of backfill may be cause for rejection of pipe.
- B. The results of each density test shall be recorded on a test sheet. The following information shall be recorded.
 - 1. Horizontal and vertical location.
 - 2. Density and percent of referenced standard compaction.
 - 3. Material description and appropriate compaction control standard

END OF SECTION

SECTION 31 25 00
EROSION CONTROL

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- A. See section 32 92 19 Seeding.
- B. Requirements of Federal, State, and local statutes and regulations dealing with pollution shall be strictly adhered to by the Contractor.
- C. Contractor shall comply with all laws and regulations relating to prevention and control of erosion.

1.2 GENERAL

- A. Erosion Control – Where the Drawings call for Erosion Control, Contractor shall install erosion control mat, seed and fertilizer in accordance with Section 32 92 19 Seeding.
- B. Contractor shall implement erosion control as soon as practicable to limit the potential for sediment transport and rilling of disturbed slopes and/or embankment slopes.

1.3 ENVIRONMENTAL PROTECTION

- A. The Contractor shall comply with the provisions of Federal, State and local statutes, ordinances and regulations dealing with the prevention of environmental pollution and the preservation of public natural resources that may affect or may be affected by the project. The Contractor shall familiarize himself with all such statutes, ordinances and regulations, whether listed or not.

PART 2 - PRODUCTS

2.1 SEED, FERTILIZER AND EROSION PROTECTION MAT

- A. See Section 32 95 00, Seeding, for erosion control product specifications.

PART 3 - EXECUTION

3.1 EROSION CONTROL

- A. Seed all areas designated on the Drawings in accordance with the Specifications Section 32 92 19.
- B. Best management practices for erosion control shall be observed to prevent construction related erosion impacts to receiving waters.

END OF SECTION

SECTION 32 05 09
GEOTEXTILE FABRICS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. The Work under this Section consists of furnishing all labor, equipment, supplies and materials necessary to perform all operations pertaining to the furnishing and placement of geomembrane liner and geotextile fabrics.
- B. Geomembrane containment liner is to be placed at locations shown in the contract drawings including within tank diked areas..

1.2 RELATED REQUIREMENTS

- A. Section 31 23 00 - Excavation and Fill.

1.3 SUBMITTALS

- A. General: Conform to Section 01 33 23, Shop Drawings, Product Data and Samples.
- B. Furnish Manufacturer's Information and design data, including complete product installation instruction.

1.4 DELIVERY, STORAGE AND HANDLING

- A. General Requirements: Conform to Section 01 60 13, Material and Equipment.
- B. Packaging and Identification Requirements:
 - 1. Geomembrane and geotextile rolls shall be furnished with suitable wrapping for protection against moisture, contamination and extended ultra-violet exposure prior to placement.
 - 2. Each roll or bundle shall be labeled or tagged to provide product identification sufficient for field identification.
 - 3. Products shall be stored in a manner that protects them from the elements. If stored outdoors, they shall be elevated and protected with a waterproof cover.

1.5 QUALITY ASSURANCE

- A. Manufacturer: The manufacturer of the geomembrane and geotextile materials shall have a minimum of ten years' experience in their respective fields.
- B. Sampling and Compliance Requirements:

1. A competent laboratory must be maintained by the producer of the fabric at the point of manufacture to insure quality control in accordance with ASTM testing procedures.
 2. That laboratory shall maintain records of its quality control results and provide, upon request of the specifying agent prior to shipment, a manufacturer's certificate.
 3. The certificate shall include:
 - a. Name of manufacturer.
 - b. Chemical composition.
 - c. Product description.
 - d. Statement of compliance to specification requirements.
 - e. Signature of legally authorized official attesting to the information required.
- C. Contractor shall hydrotest all containment areas prior to the placement of fill. The containment basin shall be filled to the top of the membrane liner and monitored for 24 hours. Report any fluctuations in the water level to the Owner. Contractor shall submit a minimum of three photos of each secondary containment areas taken during the hydrotest and a written report on the results of the hydrotests.
- D. Weather Limitations: All work shall be performed under weather conditions recommended by the manufacturer.

PART 2 - PRODUCTS

2.1 GEOTEXTILE FABRIC

- A. Woven Geotextile Fabric:
1. Geotextile Fabric shall be GEOTEX 315ST or approved equal.
 2. The fabric shall be inert to naturally encountered chemicals, hydrocarbons, mildew and rot resistant, resistant to ultraviolet light exposure, insect and rodent resistant, and conform to the properties in the following table.
 3. The minimum average roll value (MARV) for strength properties of any individual roll tested from the manufacturing lot or lots of a particular shipment shall be in excess of the MARV stipulated herein.

SPECIFICATION PROPERTY	TEST LIMIT	METHOD
Grab Strength	300 lbs	ASTM D-4632
Trapezoid Tear Strength	100 lbs	ASTM D-4533
CBR Puncture Strength	900 lbs	ASTM D-4833

Survivability Class 2 AASHTO M288

B. Non-Woven Geotextile:

1. The fabric shall be inert to commonly encountered chemicals, hydrocarbons, mildew and rot resistant, resistant to ultraviolet light exposure, insect and rodent resistant, spun-bound, black, fuel resistant, and conform to the properties in the following table.
2. The average roll minimum value (weakest principle direction) for strength properties of any individual roll tested from the manufacturing lot or lots of a particular shipment shall be in excess of the average roll minimum value (weakest principle direction) stipulated herein.

SPECIFICATION PROPERTY	TEST LIMIT	METHOD
Grab Strength	150 lbs	ASTM D-4632
Grab Elongation	50% max	ASTM D-4632
Trapezoid Tear Strength	65 lbs	ASTM D-4533
Puncture Strength	90 lbs	ASTM D-4833
Mullen Burst Strength	315 psi	ASTM D-3786

3. Acceptable brands include:
 - a. Geotex 601, or approved equal.

C. Geomembrane Liner:

4. The geomembrane liner shall be 23-oz per square yard yellow, high strength polyester scrim coated liner with urethane which meets or exceeds the physical and low temperature properties of Cooley L1023DEP. Liner shall be specifically designed to resist long term exposure to hydrocarbons including gasoline and diesel. The fabric shall be inert to commonly encountered chemicals, hydrocarbons, mildew and rot resistant, resistant to ultraviolet light exposure, insect and rodent resistant, and conform to the properties in the following table.
5. Geomembrane liners shall be ordered as one piece units. Seams shall be factory welded and certified prior to shipment.
6. Field verify size required and include excess to prevent binding and excessive stress.
7. Liner shall be protected and crated to prevent any damage during shipping.

8. Provide an unfolding map that indicates where the liner bundle needs to be positioned to allow for ease in unfolding at the site.
9. Install liner in accordance with the manufacturer's instructions.
10. Install liner between non-woven geotextile layers for protection.
11. The average roll minimum value (MARV) (weakest principle direction) for strength properties of any individual roll tested from the manufacturing lot or lots of a particular shipment shall be in excess of the average roll minimum value (weakest principle direction) stipulated herein.

SPECIFICATION PROPERTY	TEST LIMIT	ASTM METHOD
Tensile Strength, Grab (Warp/Fill)	350/300 lbs	D-751A
Tensile Strength, 1" Strip	240/200 lbs	D-751B
Puncture Resistance, Ball	500 lbs	D-751
Low Temperature Flexibility	-65oF	D-2136
Ply Adhesion	35 lbs/2in	D-751

12. Acceptable Brands
 - a. Cooley L1023DEP

2.2 LINER SEAMING

- A. Field seaming is prohibited unless approved in writing by the Owner. If approved, all field joints must be bonded by a qualified technician using manufacturers recommendations, material and equipment.

PART 3 - EXECUTION

3.1 INSTALLATION OF GEOTEXTILE FABRICS

- A. Preparation:
 1. Prepare subgrade and embankment as specified.
 2. Grade to a smooth surface, leaving no surface undulations or irregularities that the fabric can stretch and "bridge" over.
 3. Remove any loose and angular materials, rocks and sticks that may damage the fabric.
- B. Installation:
 1. The geotextile fabric sheet shall be unrolled, positioned, and drawn tight without stretching, in accordance with manufacturer's

recommendations.

2. Geomembrane liner shall be crated to prevent any damage during shipping. Provide an unfolding map which indicates where the liner bundle needs to be positioned to allow for ease in unfolding at the site. Install liner in accordance with the manufacturer's instruction by a certified installer. Install between layers of non-woven geotextile for protection.
3. No penetrations are allowed through the geomembrane liner except at the top of exterior dike wall.
4. Construction vehicles will not be allowed to travel directly on the fabric.
5. Take due care to ensure that fabric is not damaged during construction activities.
6. Fabric damaged to a degree that compromises its intended capabilities shall be replaced with same approved geotextile fabric at no additional cost to the Owner.

3.2 FILL PLACEMENT

- A. Fill or backfill placement shall be in accordance with Section 31 23 00 Excavation and Fill.
- B. A minimum of 12 inches of fill material shall be placed before any construction equipment is permitted to pass over the installed geotextile or geomembrane liner. At no time shall equipment be operated on the unprotected fabric.
- C. Care shall be taken to avoid tears or other damage to the fabric during placement. Tears or damage are cause for repair or replacement of the fabric at the Contractor's expense.

3.3 GEOTEXTILE FABRIC REPAIR

- A. If the geotextile becomes torn or damaged, it shall be repaired at the Contractor's expense prior to backfill operations.
- B. The fill material shall be cleaned from the surface of the geotextile and the torn area overlain with new fabric, providing a minimum of 3 feet of overlap around the edges of the torn area. Care shall be taken that the patch remains in place during subsequent fill placement.

3.4 GEOMEMBRANE REPAIR

- A. Any repairs made to the geomembrane liner shall be patched with the lining material and shall be performed by a qualified manufacturer technician in accordance with manufacturer instructions.

- B. The repaired lining shall retain its factory warranty and shall perform in “as new” condition. If the liner cannot be repaired to the satisfaction of Owner or if the repair is not covered under the manufacturer’s warranty then the Contractor shall provide a new liner in place of the damaged one at no additional cost to the project.

END OF SECTION

SECTION 32 31 13
CHAINLINK FENCES AND GATES

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. The work covered by this Contract includes the furnishing of all labor, tools, equipment and materials necessary to design, fabricate, coat, package for shipment, and delivery, fence materials as shown on the attached Contract Drawings and described in this Specification.
- B. Fencing is to be 8-feet in height measured from the ground surface to the top of the fence fabric.

1.2 REFERENCES

- A. The fence and materials shall be in accordance with this Specification, the Contract Drawings and with the following:
 - 1. 2004 Alaska Department of Transportation Standard Specifications for Highway Construction Section 607.

1.3 DEFINITIONS

- A. In this specification, the following words or expressions shall be understood to have the meaning given below:
 - 1. Fence – Chainlink fencing, fabric, pipes, posts, plates, gates, wire, truss rods, fasteners, latches and other materials shown in the Contract Drawings and necessary to install fence.
 - 2. Temporary Security Fence - Chainlink fencing with galvanized steel posts constructed of new materials or previously used chainlink fence in good condition.
 - 3. Safety Fence - Orange fabric fence with t-posts.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. The submittals include:
 - 1. Product Data: Submit manufacturer's standard printed information and literature for all materials to be incorporated in the work.
 - 2. Shop Drawings: Submit dimensionally correct (scaled) shop drawings for all items to be fabricated (gates, etc.).
 - 3. Assembly procedures and standard details for the installation of all fence materials.

1.5 QUALITY ASSURANCE

- A. The manufacturer shall be experienced and regularly engaged in the supply and installation of fence materials. The manufacturer shall understand the system design and its intent and shall produce components suitable to accomplish that intent. Any deficiencies in the Contract Drawings or these Specifications which may jeopardize the performance of the system shall be brought to the immediate attention of the PROJECT MANAGER, prior to submittal of product description and information for acceptance, whenever possible.

1.6 IDENTIFICATION

- A. All fence materials for each facility shall be marked with an identifying number that identifies which facility and component of the fence they pertain to.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Packaging:
 - 1. Contractor shall verify shipping dimensions and weight limitations with shipper to ensure that the receipt and delivery of materials will not require the use of specialized equipment.
 - 2. Packing must meet the shipping requirements of all anticipated carrier(s) and be adequate to protect the materials from being damaged.
 - 3. Individual packages/crates must be limited to three thousand pounds (3,000) gross weight and be suitable for lifting by forklift and cable sling.
 - 4. Contractor shall provide packing lists with all bundles and packages which shall list all materials contained in the package or bundle. Packing list shall be securely attached to each bundle in a watertight carrier.

PART 2 - PRODUCTS

2.1 NEW FENCING MATERIALS, POSTS AND ACCESSORIES

- A. Zinc-Coated Steel Wire Fabric:
 - 1. Type 1-1.2 oz/sq ft , 2-inch mesh, 9 gauge
 - 2. Fabric selvage to be twist, twist.
 - 3. Provide three strands of 12.5 gauge, 4-point, class III barb wire.
- B. Tension Wire for top and bottom of Fabric: 7 gauge, coil spring steel, Class III

- C. All pipe should be SS40 Standard Fence Pipe. Posts and Braces (Class 1, zinc-coated steel pipe, Grade A or B):
1. Line Posts: 2.375-inch O.D. and weight of 3.12 lb/ft.
 2. End, Corner, Man Gate and Pull Posts: 2.875-inch O.D. and weight of 4.64 lb/ft.
 3. Gate Posts: 4-inch O.D. and weight of 6.56 lb/ft.
 4. Brace Rail: 1.66-inch O.D. and weight of 1.84 lb/ft.
 5. Top Rail: Use top Tension wire unless otherwise noted.
- D. Gates:
1. Size and type shown on Drawings.
 2. Class 1 steel pipe, Grade A or B, 1.90-inch O.D. and weight of 2.28 lb/ft.
 3. Gate leaves 6 feet wide and wider shall have either intermediate members and diagonal truss rods or shall have tubular members as necessary to provide rigid construction, free from sag or twist.
 4. Gate leaves less than 6 feet wide shall have truss rods or intermediate braces.
 5. Gate fabric shall be attached to the gate frame by method standard with the manufacturer except that welding will not be permitted.
 6. All hardware shall be zinc-coated.
 7. Latches:
 - a. Frost free or strongarm latch for double gates, fork latch for single man gates.
 - b. Latches shall be arranged for pad-locking so that the padlock will be accessible from both sides of gates.
- E. Accessories: Ferrous accessories shall be zinc-coated steel.
1. Tension bars: 1/4 -inch x 3/4-inch flat bar.
 2. Standard tension bands: 1/8-inch x 1-inch with 5/16-inch carriage bolt.
 3. Wire Ties and Clips: 9 gauge.
 4. Steel Hog Rings: Aluminum or steel post ties
 5. Truss Rods: 3/8-inch diameter.
- F. Zinc Coating:

1. All steel and iron parts will be zinc-coated after fabrication in accordance with FS RR-F-191.
2. Weight of zinc coating per square foot of actual surface shall average not less than 1.2 ounces and no individual specimen show less than 1.0 ounce.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install posts, fabric, gates and accessories in accordance with ANSI/ASTM F567 and the manufacturer's instructions.
- B. Repair damaged galvanized surfaces with an approved cold galvanizing compound in accordance with manufacturer's instructions.

3.2 POSTS

- A. Spacing: Space posts equidistant measured on a horizontal line; on straight runs, space at 10 feet maximum.
- B. Location:
 1. Locate terminal posts (end, corner, and gate) at the beginning and end of each continuous length of fence and at abrupt changes in vertical and horizontal alignments.
 2. On straight runs, brace posts in two directions to act as pull posts.
- C. Setting:
 1. Set posts plumb and to the depth shown on the Drawings.
 2. Posts to be placed to minimum 5-foot embedment or as indicated on the Drawings.

3.3 INSTALLING FABRIC

- A. Place fabric on the outside of posts around the area enclosed.
- B. Cut fabric by untwisting a picket, and attach each span independently at all terminal posts.
- C. Attach one end and then apply tension to remove all slack and attach other end, using stretcher bars with tension bands at maximum 15-inch intervals or any other approved method.
- D. The installed fabric shall have a smooth, uniform appearance, free from sag.

- E. Install fabric 2 inches above ground level with a tolerance of plus or minus 1-inch at each post.
- F. Fasten fabric to line posts at intervals not to exceed 15 inches and to the top and bottom tension wires at intervals not to exceed 24 inches.
- G. Join sections of fabric by weaving a single picket into the ends of the rolls to form a continuous mesh.

3.4 BRACES AND TRUSS RODS

- A. Braces and truss rods shall be installed as indicated and in conformance with the standard practice for the fence furnished.
- B. Horizontal (compression) braces and diagonal truss (tension) rods shall be installed.
- C. Braces and truss rods shall extend from terminal posts to first line post.
- D. Diagonal braces shall form an angle of approximately 40 to 50 degrees with the horizontal.

3.5 TENSION WIRES

- A. Tension wires shall be installed along the top and bottom of the fence line and attached to the terminal posts of each stretch of the fence.
- B. Top tension wires shall be installed within the top 4 inches of the installed fabric.
- C. Bottom tension wire shall be installed within the bottom 6 inches of the installed fabric.
- D. Tension wire shall be pulled taut and shall be free of sag.

3.6 GATES

- A. Install plumb with tops of posts level with each other.
- B. Gate fabric shall be the same design and height of line fence fabric, furnished with twisted selvage top and bottom.
- C. Install as detailed in the Contract Drawings: Intermediate clips shall be installed at the midspan of each bottom tension wire, between posts.

3.7 GROUNDING

- A. Electrical grounds shall be installed along the fence between gate openings, at locations shown on the Plans. Electrical grounds shall also be installed where a power line passes over the fence.

3.8 TEMPORARY FENCE

- A. The Contractor shall furnish, install, and maintain a 6-foot temporary fence to provide a continuously secure and enclosed area around the project site during construction activities. Temporary fencing shall be chainlink with galvanized steel posts constructed of new materials or previously used chainlink fence in good condition. Posts shall be galvanized steel pipe of adequate diameter to provide rigidity. Posts shall be mounted on concrete footings or driven into the ground such that the fence cannot be knocked down by wind or pedestrians. Fabric shall be woven vinyl coated or galvanized steel mesh. Provide in continuous lengths to be wire tied to fence posts or prefabricated into modular pipe-framed fence panels.

Install temporary fence in locations shown on Drawings or as proposed by the Contractor and approved by the Project Manger that maintains job site security and meets Owner's needs. Install posts at 10-foot maximum spacing and securely fasten fabric. There shall be less than 6 inches of clearance between fence fabric and grade. Posts and fabric shall be secured such that they cannot be easily moved or separated for pedestrian access. Install fence in straight lines with no gaps. Temporary security fencing shall be maintained during working and non-working hours. Maintain fence in good condition and immediately repair any damaged fence sections.

Temporary fence shall be replaced by permanent fence prior to project completion as detailed in the drawings.

END OF SECTION

SECTION 32 92 19

SEEDING

PART 1 – GENERAL

1.1 SUBMITTALS

- A. Duplicate copies of a statement signed by the vendor certifying that each lot of seed has been tested by a recognized seed testing laboratory within 6 months before the date of delivery to the Project.
- B. Duplicate copies of certification from grower certifying grass species.

1.2 SCOPE OF WORK

- A. Areas grassed and/or seeded prior to construction and excavated or otherwise disturbed during construction operations shall be restored to their original condition.
- B. The following areas shall be seeded in accordance with this section:
 - 1. Previously vegetated areas of local material sources.
 - 2. Roadway side slopes, including that for any haul roads to remain after construction activities.
 - 3. Previously vegetated areas that were disturbed by construction activities.
 - 4. The side slopes of embankments.
 - 5. All other areas defined on the Contract Drawings.

1.3 REFERENCE

- A. Roadway Seeding - Refer to "A Revegetative Guide for Conservation Use in Alaska," May 1991, published by Cooperative Extension Service of the University of Alaska Fairbanks.

PART 2 – PRODUCTS

2.1 SEED

- A. Grass seed of the type hereinafter specified shall conform to the standards of State Department of Agriculture.\
- B. Seed shall be furnished in standard containers on which shall be shown the following information:
 - 1. Common name of seed
 - 2. Lot number

3. Net weight
 4. Percentage of purity
 5. Percentage of germination (in case of legumes percentage of germination to include hard seed)
 6. Percentage of weed seed content and inert material clearly marked for each kind of seed in accordance with applicable state and federal laws.
- C. Grass Seed Mix and Application Rates (broadcast method):
1. Bering Hairgrass (Norcoast): 26 lbs per acre
 2. Arctared Red Fescue: 12 lbs per acre
 3. Annual Rye Grass: 5 lbs per acre

2.2 FERTILIZER

- A. General:
1. Fertilizer shall be a standard commercial grade of organic or inorganic fertilizer of the kind and quality specified herein. It may be separate or in a mixture containing the percentage of total nitrogen, available phosphoric acid, and water-soluble potash in the amounts specified.
 2. All fertilizers shall be furnished in standard unopened containers with weight, name of plant nutrients, and manufacturer's guaranteed statement of analysis clearly marked in accordance with state and federal laws.
 3. Fertilizer shall be ground to a fineness as required for the method of application.
- B. Fertilizer Analysis and Application Rates:
1. Total Nitrogen: 60 lbs per acre
 2. Available Phosphoric Acid: 100 lbs per acre
 3. Water Soluble Potash: 50 lbs per acre

PART 3 – EXECUTION

3.1 GRASS SEEDING

- A. Seeding shall be performed as soon as practicable after ground disturbing activities.
- B. Seeding shall not be performed during windy weather or when the ground is frozen, excessively wet or otherwise untillable.

- C. Seedbed Preparation:
 - 1. Sideslopes shall be no steeper than 2 horizontal to 1 vertical and shall be compacted and tracked by a dozer to reduce erosion.
 - 2. The tracked ground surface shall be covered with an erosion control blanket (North American Green S75, or approved equal) in accordance with the manufacturer's recommendations.
- D. Grass seed shall be applied at the rates specified above.
- E. Fertilizer shall be applied at the rates specified above.
- F. Seeding Time:
 - 1. The exact time for seeding will be determined by actual weather conditions.
 - 2. The normal satisfactory period for seeding shall be considered between May 15 and July 15 unless otherwise authorized by the Authority.
- G. When weather conditions are such that satisfactory results are not likely to be obtained for any stage of the seeding operations, the Contractor shall stop the work and it shall be resumed only when the desired results are likely to be obtained or when approved alternates or corrective measures and procedures are adopted.
- H. The Contractor shall protect all seeded areas from erosion until final inspection and acceptance has been made and until such time as grass leaves are visible to the eye.
- I. Areas damaged by erosion shall be repaired by the Contractor at his own expense.

3.2 WATERING

- A. Duration:
 - 1. The Contractor shall water all seeded areas a minimum of three times each week or often enough to maintain a moist seed bed to promote healthy seed germination, whichever provides the greater watering frequency, for a duration of 30 days.
 - 2. Watering shall cease at first hard frost in the Fall and shall resume upon ground thaw the following Spring.
 - 3. If at any time during the maintenance period weather conditions (such as extended period with no rain or continuous drying winds) cause the root zone to dry out, the Engineer may direct the Contractor to water all seeded areas.
 - 4. Any supplemental watering shall be done immediately at no additional cost the Owner.

- B. Water application shall be applied at a rate that will provide moisture penetration throughout the entire root zone with a minimum of water run-off and no erosion.
- C. Should soil conditions be encountered not conducive to water absorption, the Contractor shall take whatever corrective actions that may be required to correct this condition, without additional cost the Owner.

3.3 FINAL INSPECTION

- A. Final inspection for seeded areas shall not be made until 30 days following completion of all seeding and fertilizing as specified.
- B. Damage caused by the Contractor to areas which have been seeded shall be repaired and/or replaced by the Contractor at his own expense.

3.4 GUARANTEE

- A. Guarantee of planting and seeding shall continue for one year from date of final acceptance.
- B. Contractor shall replace all seeded areas as required during the guarantee period.
- C. Guarantee shall include both materials and labor.
- D. Replacements shall be the same as originally planted.

END OF SECTION

SECTION 33 05 00
COMMON WORK RESULTS FOR UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. All work specified in Division 33.

1.2 SCOPE OF WORK

- A. This section and Division 33 applies to bulk fuel tank farms, dispensers, bulk fuel transfer systems, and utilities.
- B. Provide the new facilities as shown and specified, including the following:
 - 1. Construct all new work providing complete and operating systems.
 - 2. Furnish and install Mechanical systems, including:
 - a. Exterior Fuel Piping, Tanks, and Fuel Equipment.
 - b. All appurtenances, accessories, fittings, valves, dampers, and devices related to fuel systems.
 - c. Fuel System Start Up.
 - d. Training and warranty.
- C. All equipment and installation shall be in compliance with OSHA regulations.
- D. Intent:
 - 1. The Intent of the Contract is to include all labor and materials, tools, hoisting, scaffolding, supervision, equipment, and transportation necessary or reasonably inferable as being necessary for the execution of the work.
 - a. The Contract Documents endeavor to communicate intended completed work. Interim stages, methods, and means may not be specifically indicated where such is reasonably inferable by qualified Contractors and workers.
 - 2. The Contractor is responsible for providing the finished work, tested and ready for operation.

3. By submitting a proposal, the Contractor represents that they has made a thorough examination of the site, of the work, and all existing conditions and limitations, and that they have examined the Contract Documents in complete detail and has determined beyond doubt that the drawings, specifications, and existing conditions are sufficient, adequate and satisfactory for the execution of the work under the Contract.
4. Where minor adjustments of the work are necessary for purposes of fabrication, scheduling, or installation of items, for accommodation of site conditions reasonably inferable for this project, or resolution of conflicts between items within the intent of the Contract Documents, the Contractor shall make such adjustments at no added expense to the Owner.
 - a. Where such adjustments affect functional or aesthetic design of the work, they shall first be submitted to the Owner's Representative for review and approval.

1.3 COORDINATION

- A. Contractor shall be thoroughly acquainted with the work involved and shall verify at the site those measurements necessary for proper installation of the work.
- B. Contractor shall refer to engineered drawings for site and building construction and other details which affect the mechanical installation.

1.4 DEFINITIONS AND ABBREVIATIONS

- A. Contractor: The word "Contractor," as used in these Specifications, means the mechanical subcontractor.
- B. Owner's Representative: The person or entity designated by the Owner. It may be different persons or entities for different applications.
- C. Provide: The word "provide," as used in these Specifications, means furnish and install, complete and ready for the intended use.
- D. Indicated: The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the reader locate the reference. Location is not limited.
- E. Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted," mean directed by the Owner's Representative and similar phrases.
- F. Specialist: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are

recognized experts in the operations to be performed. The specialists must be engaged for those activities, and assignments are requirements over which the Contractor has no choice or option. Nevertheless, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor. This requirement shall not be interpreted to conflict with enforcement of building codes and similar regulations governing the Work. It is also not intended to interfere with local trade union jurisdictional settlements and similar conventions.

1.5 STORAGE AND PROTECTION OF EQUIPMENT AND MATERIALS

- A. General: At all times take such precautions as may be necessary to properly protect all material and equipment from damage.
 - 1. Cap, plug, or otherwise protect all temporary openings in materials and equipment to prevent entry by foreign matter.
 - 2. Protect from injury by others.
- B. Keep installations clean.
 - 1. Restore installations including piping and equipment, which is damaged by any means including weather, rust, paint, dirt, and physical damage or to new condition prior to installation. Replace rejected piping, equipment, etc. with new materials.
 - 2. Deliver systems to Owner with clean filters, clean strainers, and all bearings properly lubricated.
- C. Cover stored materials and specialties to protect from moisture and dirt. Elevate above grade.
 - 1. Retain protective covers and caps on materials and equipment when provided by manufacturers.
- D. Store equipment a minimum of 2 feet above ground and under protective cover. If storage location is subject to moisture, keep covered with plastic sheeting, arranged to provide adequate ventilation and prevent trapping of moisture.
 - 1. Cover all motors and bearings with watertight and dustproof covers during storage and construction.
- E. Rejected items shall remain property of Contractor.

1.6 SEQUENCING AND SCHEDULING

- A. Sequence, coordinate, and integrate installations of materials and equipment for efficient flow of the Work.
 - 1. Sequence mechanical equipment installation with other site work.

2. Coordinate connection of electrical services.
 3. Coordinate with other trades to maintain access routes to mechanical systems.
- B. Schedule inspections and tests of mechanical materials and equipment while they are exposed.
1. If defective installations are discovered or suspected by Owner, uncover work for inspection and correction of defective condition.

1.7 SAFETY AND PROTECTION

- A. Safety Measures to be Taken: The Contractor shall be solely and completely responsible for conditions of the jobsite, including safety of all persons and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. Comply with "Safety and Health Regulations for Construction," Volume 36, No. 75, Part II of the Federal Register by the U.S. Department of Labor. Contractor shall be responsible for providing all such safety measures and shall consult with the state or federal safety inspector for interpretation whenever in doubt as to whether safe conditions do or do not exist or whether it is or is not in compliance with state or federal regulations.
1. The Engineer has not been retained or compensated to provide design and construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences, or procedures required for the Contractor to perform its work. The Engineer's observations of the Contractor's performance are not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the construction site.
- B. Drive Guards: Provide OSHA-approved drive and shaft guards for all exposed, rotating drive shafts and drive connections between motors and driven equipment including fans, pumps, compressors, etc. Guards shall include heavy-duty steel frames securely fastened for easy removal to the equipment frame. Guards, in general, shall be solid sheet metal with tachometer cutout at shafts where applicable. Fan belt guards shall be heavy mesh or expanded metal to permit airflow. Guards may be provided by the equipment manufacturer or fabricated by this Contractor to the manufacturer's clearances, configurations, etc.

1.8 CODES, PERMITS, AND INSPECTIONS

- A. Work shall be installed in conformity with applicable local ordinances and state statutes. Standards and sizes which meet or exceed preceding requirements shall be installed as indicated.
- B. Give necessary notices, obtain permits, and pay taxes, fees and other costs, including utility connections or extensions for the work. File necessary

plans, prepare documents and obtain necessary approvals of governmental departments having jurisdiction. Apply for and pay for all utility meters and gauges required. Obtain required certificates of inspection for work; retain in the Project Closeout manual and deliver to the Owner's Representative before request for acceptance and final payment for the Work.

- C. Comply with laws, ordinances, rules, regulations, and lawful orders of any public authority bearing on the performance of the work.
- D. Material and equipment within the scope of the UL Testing Laboratory Service shall be listed by the Underwriters Laboratories for the purpose for which they are used and shall bear their listing mark.
- E. Contractor shall call for all inspections by the authority having jurisdiction when they become due and shall not cover any work until approved by the governing authorities.

1.9 QUALITY ASSURANCE

- A. Single Source Responsibility: Comply with the requirements specified in Division 01 Section, "Materials and Equipment".
- B. Warranty: Products, material, and installations shall be warranted by the manufacturer against defects in material and workmanship for a period of twelve (12) months from the date of acceptance. Any portion of the work repaired or replaced under warranty shall be warranted for the remainder of the original warranty period.
 - 1. Certain items have longer warranty requirements stated in their respective specification sections. The foregoing shall not limit such warranties, and the longer warranty provisions shall apply.
- C. Unless otherwise indicated or specified, all materials shall be new. Contractor shall properly store all materials and equipment for protection from physical damage or damage due to corrosion.
- D. Standardization of Manufacturer: This Contractor shall make every effort to furnish all equipment of any equipment type (such as all fans, all motors, all motor controls, all pumps, all valves, and etc.) from one manufacturer. Confirm before ordering, requirements of standardization with Owner's existing equipment.
- E. Rigging and Appliances: Provide all rigging, scaffolding, staging, and ladders required for complete installation of all equipment.
- F. Manufacturer's Directions: Each material for which the manufacturer issues written directions shall be used according to its manufacturer's directions, as approved and if not at variance with these specifications.
 - 1. If manufacturer's directions are at variance to the contract documents, install to the more stringent requirement within the

terms of the manufacturer's warranty. If warranty conflicts arise, refer the question to the Owner's Representative before proceeding.

- G. Equipment Furnished by Others: For installation of equipment and casework furnished by others and installed by this Contractor, roughing-in dimensions shall be obtained from approved shop drawings, by measurements from the actual equipment, details shown on drawings, or as directed by Owner's Representative.
- H. Accessibility: Install all equipment to be easily accessible for operation, maintenance, or repair. Equipment deemed inaccessible shall be relocated as directed.
- I. Drawings and specifications shall be taken together. Provide work specified and not drawn or work drawn and not specified as though mentioned in both.
- J. General Locations and Arrangements:
 - 1. Drawings (plans, schematics, and diagrams) indicate general location and arrangement of fuel systems and utilities and do not attempt to show exact details or all offsets in piping. Do not scale drawings to obtain final cut lengths, quantities, or the like. Examine the site drawings for exact location of tanks and equipment.
 - 2. Indicated locations and arrangements were used to size ducts and pipe and to calculate friction loss, expansion, and other design considerations. Install systems as indicated, unless deviations to layout are approved in advance on coordination drawings.
 - 3. Follow drawings in laying out work and check drawings of other trades to verify locations in which work will be installed. Install piping in such a manner as to conform to site conditions, structure, avoid obstructions, and keep openings and passageways clear. Lines that must pitch, or that must have a constant elevation, shall have the right-of-way over lines not so restricted. If site conditions appear inadequate, notify the Owner's Representative before proceeding with the work. Make reasonable modifications in the work without extra cost as needed to prevent conflict with work of other trades and for proper execution of the work.
 - 4. Site Conditions: The design documents indicate certain site conditions to assist the Contractor. These drawings are not intended to indicate all conditions. It shall be the responsibility of the Contractor to verify all site conditions and include the removal or relocation of equipment, piping, and wiring in the Contract.

1.10 SUBSTITUTIONS

- A. Brand Names: The use of brand names is for the purpose of description and establishing quality and does not eliminate the requirements of meeting specifications.

- B. Exceptions: Other brands will be allowed except where an item or class of material is specified exclusively by trade name and followed by word "only."
- C. Requests for Substitutions: Approval of alternative and/or substitute products will be considered only under terms and conditions specified in Division 01.
- D. Changes Due to Substitutions: Design is based on equipment as listed in the equipment schedules and/or specified elsewhere in Division 23. Where implementation of an approved substitution requires redesign to any part of the work, provide such redesign. Obtain approval of redesign from the Owner's Representative. Redesign cost and additional construction cost, including related and incidentally affected work, resulting from the redesign shall be at the Contractor's expense.

1.11 SUBMITTALS, APPROVALS, AND REVIEWS

- A. Provide submittals for all products and systems described in Division 33 and shown on the drawings to demonstrate compliance with the requirements of the project. Furnish equipment submittals, include data for review, and organize data in the manner described below. Submittals procedures shall comply with applicable requirements of Division 1 specifications.
- B. Review of submittals will not relieve the Contractor of responsibility for dimensions and/or errors that may be contained in them, or deviations from the Contract Documents' requirements. It shall be clearly understood that the noting of some errors but overlooking others does not grant the Contractor permission to proceed in error. Regardless of any information contained in the submittals, the requirements of the Contract Documents shall govern and are not waived or superseded in any way by the review of the submittals.
 - 1. Submittals processed by the Owner's Representative and/or Architect/Engineer design team are NOT Change Orders. The purpose of Contractor Submittals is to demonstrate to the Architect/Engineer design team that the Contractor understands the design concept and demonstrates its understanding by indicating which equipment and material it intends to furnish and install and by detailing the fabrication and installation methods it intends to use.
- C. General: Submittals shall be legible. Degraded faxes, faded or smudged literature, or literature too tiny as to be reasonably read if reproduced at ½ size will be rejected without further review.
 - 1. Contractor further agrees that if deviations, discrepancies, or conflicts between Submittals and Specifications are discovered either prior to or after Submittals are processed by the Architect, the Design Drawings and Specifications shall govern and shall be followed.
- D. Product Literature Requirements:
 - 1. Provide all submittals electronically. Indicate the following:

- a. Contractor's name and contact information; and project title on the cover page.
- b. Table of contents.
 - 1) List sections and each item in the section.
- c. Divide the submittals into sections by specification section. Place a numbered divider between each section.
 - 1) Table of contents for each section.
 - 2) Place each submitted item within its specification section.
 - 3) Include a separate section for items indicated on the drawings only.
- d. On each item or product, customize the submittal to thoroughly convey the contractor's intent. The terminology "As Specified" used without marked up listing is not acceptable. (Show exactly what will be provided to include options or deletions.)
 - 1) Mark submittal literature to indicate the make and model, materials, accessories, and options proposed. Cross out those not proposed. Unmarked literature indicates ALL accessories options will be provided.
 - 2) Identify each item. Mark the project Tag or ID. Mark the specification reference and/or drawing reference which the submittal satisfies.
 - 3) Mark the manufacturer's name and address, and supplier's name, address and phone number.
 - 4) Rough-in data and dimensions.
 - 5) Operating characteristics.
 - a) Performance curves and rated capacities. Indicate the point on the performance curve which satisfies the contract requirements.
 - b) Temperature range and limitations, if applicable.
 - c) Motor and electrical characteristics.
 - d) Wiring diagrams for the specific system operation.
 - 6) Indicate whether item is "As Specified" or "Proposed"

Substitution”.

- a) For substitutions, indicate any deviations from the specified item on the submittal. Include physical size, materials, and performance characteristics, as well options and features.
 - 7) Working construction drawings (shop drawings) for other than stock manufactured items.
- E. Partial Submittals are permitted with cause only after prior approval such as for long lead items require special attention. Piecemeal submittals, and submittals not organized and tabbed by specification section will be returned without review.
- F. Shop Drawing Requirements:
- 1. Shop Drawings are for the benefit of the contractors to resolve spatial conflicts and appropriate design before the opportunities for acceptable solutions diminish. They are to convey work customized by the tradesmen for this project including, but not limited to, layouts of assemblies of field-fabricated components, pipe, and equipment.
 - a. Spatial conflicts which arise as the project progresses which have not first been addressed by shop drawings are expressly assigned to the contractor for resolution within the contract requirements without additional cost to the owner.
 - b. Where work obstructs the space needed for O&M, work shall be removed and redone to satisfy O&M spatial requirements without additional cost to the owner.
 - 2. Shop Drawings utilizing manufactured equipment shall be reviewed by the manufacturer to determine correct product application before submitting. The manufacturer’s determination shall be evident on the submitted shop drawing.
 - 3. Shop drawings shall be drawn to scale by skilled drafters to conventions and norms prevailing in the field of architectural drafting. Specialized terms, symbols, and techniques which add accuracy and concisely convey the intent are encouraged.
 - a. Shop Drawings shall include horizontal and vertical dimensions. Multiple views (top, side, front, cross-section, isometric, and etc) shall be used if necessary to illustrate the purpose of the Shop Drawing.

1.12 OPERATION AND MAINTENANCE MANUALS

- A. Provide Operation and Maintenance (O&M) Manuals for all products and systems described in Divisions 33 and shown on the drawings. Furnish in

time for training of Owner's personnel in operation and maintenance of systems and related equipment. O&M submittal procedures shall comply with applicable requirements of Division 1 specifications and this section.

B. Operating and Maintenance Sequence and Procedures:

1. All written information shall be typewritten. Handwritten notes, lists, or the like will not be accepted.
2. Contents: In each chapter, describe the procedures necessary for personnel to operate the system and equipment covered in that chapter. Provide procedures for start-up, operation, emergency operation, and shutdown.
 - a. Start-up: Give complete step-by-step instructions for initial energizing equipment, making initial settings and adjustments whenever applicable.
 - b. Operation: Give instructions for continued operation including ongoing settings. Commands, overrides, and adjustments whenever applicable.
 - c. Shutdown Procedure: Include instructions for stopping and securing the equipment after operation. If a particular sequence is required, give step-by-step instructions in order.
 - d. Emergency Operation: Give detailed instructions for emergency procedures required to prevent damage to equipment and property, etc.
 - e. Provide a schedule of preventive maintenance for each product. Recommend frequency of performance for each preventive maintenance task; i.e., cleaning, inspection, etc.
 - f. Provide instructions and schedules for all routine cleaning, lubrication and inspection with recommended lubricants for all equipment and systems. Schedule times of the year that inspection and maintenance should be performed.
 - g. Provide instructions for minor repair or adjustments required for preventive maintenance routines, limited to repairs and adjustments which may be performed without special tools or test equipment, and which require no extensive special training or skills.
 - h. Special Maintenance: Provide all information of a maintenance nature covering warranty items, etc., which have not been discussed elsewhere.

- C. **Manufacturer's Catalog Cuts:** Include manufacturers' descriptive literature covering all appurtenances used in each system, together with illustrations, exploded views and renewal parts lists. Include name, address and phone number of supplier.
- D. **Shop Drawings:** Provide a copy of all corrected, approved shop drawings covering equipment for the project either with the manufacturers' catalog cuts or properly identified in a separate subsection.
- E. **Spare Parts Lists:** Include a list of all equipment furnished for project, with a tabulation of descriptive data of all the spare parts proposed for each type of equipment or system. Properly identify each part-by-part number and manufacturer, include address and phone number.
- F. **Other Items:**
 - 1. **Valve Directory:** Indicate valve number, size, location, function and normal position for each numbered valve.
 - a. Provide a complete Valve Directory in the O&M Manual.
 - 2. **Name Plate Directory:** Provide list of fans, pumps, automatic dampers, and all other major equipment nameplates, giving manufacturer's nameplate data, nameplate designation, location of equipment, area served, switch location, normal position of switch, and equipment label designations specified. Submit directory for review and obtain approval prior to substantial completion of project.
- G. Number all pages to assure correct placement in manual.

1.13 OPERATING PERSONNEL INSTRUCTION

- A. **General:** Provide instruction of all pertinent mechanical systems to facility operating personnel prior to facility acceptance, upon mutually satisfactory arrangement with Owner.
 - 1. **Instruction:** Instruction shall begin only after the component, assembly, or system is complete and has been tested and is in acceptable operating condition. Instruction shall encompass normal operation, emergency operation, fire and other hazards, safety provisions, pollution prevention provisions, and maintenance procedures for all work provided.
 - 2. **Instructors:** Instructors shall be qualified on the system being instructed. Include the Contractor's staff supplemented by authorized representatives of the component, assembly, or system manufacturer.
 - 3. **Aids:** Instruction process shall utilize the O&M manuals which, if deemed unsatisfactory in any content, shall be supplemented in a manner to achieve useful, pertinent, and complete instruction.

4. Time: Provide all necessary instruction to the complete understanding of the operating personnel. No individual session shall last more than 4 hours per day. Minimum total instruction periods shall be as follows except that where instruction periods for longer terms are specified herein, such longer term shall apply:
 - a. Piping, and Tanks systems: 8 Hours.
 - b. Controls: 16 hours.
5. Statement of completion: At the conclusion of each training session, provide the Owner's Representative with a form containing the following information:
 - a. Name and contact information of Trainer, including company represented.
 - b. Name of each trainee.
 - c. Date of the training.
 - d. Relevant specification section satisfied by the training.
 - e. Time spent in classroom training and in hands-on practical training.
 - f. Signature of trainees confirming delivery and time of training.

1.14 CONTINUITY OF SERVICE FOR EXISTING SERVICES

- A. General: Comply with all Division 01 requirements.

1.15 PROJECT CLOSEOUT

- A. General: Comply with all Division 01 requirements.

PART 2 – PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION—COMMON REQUIREMENTS

- A. Equipment Connections:
 1. Provide piping flanges where necessary for access to equipment.
 - a. Provide flanges so equipment can be disconnected without dismantling the piping system.
 - b. Make up all piping connections to equipment with offsets

arranged that the equipment can be serviced or removed without dismantling the piping beyond the flanged connections.

- c. Welded piping systems: Wherever a welded piping system connects to equipment, valves, or other units which may require maintenance, servicing, or removal, the connecting joint shall be flanged.
- B. Install equipment in serviceable locations.
1. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum interference with other installations.
 - a. Install equipment with clear access routes.
 - b. Maintain access route to equipment, and coordinate with other trades to prevent blocking these routes by other work.
 2. Extend grease fittings to an accessible location.
- C. Install equipment according to approved submittal data and the manufacturer's or governing trade association's written instructions. Portions of the Work are shown only in diagrammatic form.
- D. Install equipment level and plumb, parallel and perpendicular to tanks and buildings on site.
- E. Install equipment giving right-of-way to piping systems installed at a required slope.

3.2 EQUIPMENT NAMEPLATES AND OPERATIONAL TAGS

- A. Provide identification nameplates for all equipment, valves, tanks, etc.
- B. Material: 3"x5"x0.08" aluminum w/ 3/16" diameter holes drilled in each corner, black Gerber thermal transfer film printed letters on Gerber 220 high performance vinyl background, color as indicated, one side only, as manufactured by Warning Lights of Alaska or approved equal.
- C. Color:
1. Nameplates: White background with black lettering.
 2. Operational Tags:
 - a. Diesel components: Apple green background with black lettering.
 - b. Gasoline components: Red background with black lettering.
- D. Information:

1. Nameplates: Provide nameplates for all pumps, electrical panels, and other components as required on the Contract Drawings.
 - a. Nameplates to include component ID as shown on the Contract Drawings.
2. Operational Tags: Provide operational tags for components as shown on the Contract Drawings.
 - a. Operational tags to include component ID (MV-1, etc), normal operating condition (normally open or closed), component owner and information required for proper operation.

3.3 MECHANICAL DEMOLITION

- A. General: Perform demolition to minimize damage to adjacent work or systems to remain intact. Comply with OSHA and this project's safety regulations in performance of demolition.
 1. Employ safety precautions throughout the demolition process.
 - a. Wear the appropriate OSHA-approved PPE for the processes employed.
 - b. Evaluate the demolition for hazardous materials. If a material is in question, notify the Owner's Representative.
 2. Remove systems completely, leaving no materials in the demolition zone abandoned in place.
 - a. Cap any adjacent piping left in place.
 3. Collect and remove demolished materials and debris regularly, but no less than once per day.
 - a. Leave demolition areas safe and clean whenever not continuously occupied by work crews.

3.4 TOUCH-UP PAINTING

- A. For minor repairs to surfaces scratched during shipping and installation.
 1. Repair all dings and scratches to original color and luster.
 2. Repair corrosion protection on metallic surfaces to match manufacturer's original.

3.5 CONNECTING EQUIPMENT FURNISHED UNDER OTHER DIVISIONS

- A. Provide rough-in and final piping connections to equipment as listed in

specifications and equipment schedules.

1. Obtain all rough-in data from approved shop drawings on all equipment.
2. Equipment and fixtures furnished under other divisions will be received, uncrated, and set in place under other divisions unless specifically noted otherwise in Division 33 or on the drawings.
3. Make required piping connections to equipment furnished under other divisions including, but not be limited to, installation of all fittings, strainers, valves, instruments, safety devices, and other piping appurtenances provided with or as an integral part of equipment.

END OF SECTION

SECTION 33 52 13
LIQUID FUEL PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and the Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Follow all provisions of Section 33 05 00, "Common Work Results for Utilities."

1.2 WORK INCLUDED

- A. Work under this section shall include furnishing all labor, materials, tools, and equipment necessary for the complete installation of the fuel system. Work shall include, but not be limited to, the following:
 - 1. Piping and Fittings.
 - 2. Piping Specialties.
 - 3. Fuel Appurtenances.
 - 4. Pipe Supports.
 - 5. Pipe and Pipe Support Coatings.

1.3 SUBMITTALS

- A. Submit each item specified in this Section according to the Conditions of the Contract and Division 01 Specification Sections and Section 33 05 00, "Common Work Results for Utilities".
- B. Provide a product list which identifies the products intended to satisfy the requirements of this specification. Catalog cuts for each product shall be included with the product list.
- C. Product Data: Provide manufacturer's literature and data indicating dimensions, rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.
- D. Submit shop drawings: indicate piping layout, required clearances, and location and size of field connections.
- E. Pipe coating process and schedule.
- F. Inspection and Testing Procedures and Results.
- G. Welding procedure qualification Records (PQRs) and welding procedure specification.

1.4 REFERENCED STANDARDS

- A. American National Standards Institute (ANSI):
 - 1. B1.20.1, Pipe Threads, General Purpose (Inch).
- B. American Society for Testing Materials (ASTM):
 - 1. A53, Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - 2. A105, Specification for Forgings, Carbon Steel, for Piping Components.
 - 3. A106, Standard for Seamless Carbon Steel Pipe.
 - 4. A181, Forgings, Carbon Steel, for General Purpose Piping.
 - 5. A183, Carbon Steel Track Bolts and Nuts.
 - 6. A234, Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
- C. American Society of Mechanical Engineers (ASME):
 - 1. ASME B31.4, Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids.
 - 2. ASME B31.9, Building Services Piping.
 - 3. B16.3, Malleable-Iron Threaded Fittings.
 - 4. B16.5, Pipe Flanges and Flanged Fittings.
 - 5. B16.34, Valves—Flanges, Threaded, and Welding End.
 - 6. B16.39, Pipe Unions, Malleable Iron Threaded.
- D. National Fire Protection Association (NFPA):
 - 1. NFPA 30, Flammable and Combustible Liquids Code.
 - 2. NFPA 31, Standard for the Installation of Oil Burning Equipment.

1.5 QUALITY ASSURANCE

- A. Piping, fittings, and valves manufactured or procured from sources beyond territorial boundaries of the United States will not be acceptable.
- B. Comply with all applicable city and state codes and ordinances. In case of conflict with drawings or specifications, the codes and ordinances shall govern.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Materials shall be new unless otherwise specified. All items of the same type shall be of the same manufacturer.

2.2 PIPING AND FITTINGS

- A. Exterior Above Grade Piping:

1. Steel Pipe:

- a. Pipe larger than 1" and located outside of the diked containment area shall be schedule 80, seamless, ASTM A106, grade "B".
- b. Pipe larger than 1" and located inside of the diked containment area shall be schedule 40, seamless, ASTM A106, grade "B".
- c. Pipe 1" and smaller schedule 160, ASTM A106 grade "B".

2. All piping & fittings shall be buttwelded or socket welded except where shown on drawings or required for equipment connection.

3. Pipe Fittings: Buttweld elbows, tees, and reducers shall be seamless, ASTM A234, grade WPB, schedule shall match adjacent piping. Buttweld elbows shall be long radius. Schedule to match pipe wall. Socketweld and threaded fittings shall be ASTM A105, 3000#.

- a. Pipe and fittings 1-1/2" and larger shall be full penetration butt welded. Flanged fittings shall be ANSI 150 lbs, raised face, weld neck, ASTM A105, bore to match adjacent pipe.
- b. Pipe and fittings smaller than 1-1/2" shall be socket welded. Flanged fittings shall be ANSI 150 lbs, raised face, socketweld, ASTM A105, bore to match adjacent pipe.
- c. Provide flanged connections as required to allow removal of individual components. Threaded fittings are not allowed except where shown on the project drawings, or required for connection to equipment.

- B. Exterior Below Ground Piping

1. Steel Pipe:

- a. Pipe 1" and larger shall be schedule 80, seamless, ASTM A106, grade "B".

2. Pipe fittings: Carbon steel buttweld conforming to ASTM A234 and ASME B16.9.

3. Pipe and fittings shall be full penetration butt welded.

4. Buttweld elbows, tees, and reducers shall be seamless, ASTM A234,

grade WTB, schedule match adjacent piping. Buttweld elbows shall be long radius. Schedule to match pipe wall.

5. Cathodic Protection: Buried pipe shall be cathodically protected.

2.3 PIPING SPECIALTIES

A. Exterior Piping Specialties:

1. Flange Gaskets: Gaskets shall be raised face, spiral wound, with stainless steel winding strip, flexible graphite filler, with carbon steel inner and outer rings, and rated for -50°F service.
2. Dielectric Isolation Flange: Provide where indicated on the project drawings and at all transitions to buried piping. Provide and assemble flanges as indicated on the drawings and as recommended by the manufacturer. Basis of Design: Pikotek VCS or approved equal.
3. Ball Valves 1-1/2" and larger: Full port, ANSI class 150 lbs., Cast carbon steel body, stainless steel ball, Teflon seat and stuffing box seals, lockable lever handle, raised faced flanged. All materials shall be suitable for the service conditions. NACE MR-01-75 Conformance and fire safe per API 607. PBV C-6410-31-2236-FTNL, or approved equal.
4. Ball Valves less than 1-1/2"
 - a. 30,000 gallon Bulk Fuel Tank Water Draw Valves - ANSI class 300 lbs., cast carbon steel body, stainless steel ball, Teflon seat and stuffing box seals, lockable lever handle. All materials shall be suitable for the service conditions.
 - b. All Others - ANSI class 150 lbs., cast carbon steel body, stainless steel ball, Teflon seat and stuffing box seals, lockable lever handle. All materials shall be suitable for the service conditions. Nibco Model No. T-590-CS-R-66-FS-LL, or approved equal.
5. Globe Valves 2" and smaller: Carbon steel body, metal seat, class 150 raised face flanges, with removable hand wheel, and NACE compliant. Warren Valve model 2155F or approved equal.
6. Check Valves: Carbon steel, ANSI class 150 lbs., raised face flanged, swing check valve. Crane No. 147XU, or approved equal. Smaller than 2", Bonney Forge 1-61-RF piston check valve or equal.
7. Wye Strainer: Flanged, carbon steel body, bottom clean-out "Y"-strainer with 1/16" perf. mesh, and blow off tapping plug. Mueller Fig. 781, or approved equal. Provide blow off tapping with lockable ball valve and threaded plug for blow down.
8. Flanged Flex Fittings: ANSI Class 150 lbs., stainless steel annular corrugated inner core with stainless steel braided cover, flanged ends, and 3/8" allowable permanent offset or as specified otherwise on project drawings or required for equipment connection. Pressure test at 110 psi and provide certification for each flex. Metraflex Metra-Mini, or approved

equal.

9. Threaded Flex Fittings: Stainless steel annular corrugated inner core with stainless steel braided cover, MPT threaded ends, and 1/8" allowable intermittent offset or as specified otherwise on project drawings or required for equipment connection. Pressure test at 110 psi and provide certification for each flex. Metraflex Model SSTT, or approved equal.
10. Pressure Relief Valves: For thermal expansion relief, class 150 raised face flanged, "E" size orifice, PC Buna seat, closed top, carbon steel body pressure relief valve set as specified on drawings. PSV's shall be Taylor Valve 8250 series, and relief pressure set as indicated on project drawings, or equal.
11. Anti-Siphon Valve: Normally closed, stainless steel body, with special expansion relief set at 25 psi. Valve set to open at 20 feet head pressure. Morrison Bros Figure 910, or approved equal.
12. Actuated Ball Valves: Normally Closed, full port, ANSI class 150 lbs, A350LF2 body, buna seats and seals. PTC self-regulating heater, NEMA 7 enclosure, 115 V AC, 600 in-lbs torque: 10 second stroke time, stainless steel mounting hardware to allow for manual operation using #10 adjustable wrench, actuator rated to -60°F. 2" ball valve shall be Nutron model T3-F20R01LZ with RCS model MAR50-10 actuator, no substitutes.
13. Pressure Switches: Adjustable differential pressure switch for NEC class I division I group D areas. Adjustable operating range 0.2 to 10 psig, 100 psig maximum operating temperature. Manufacturer: Square D, class 9012, type GAR1. Install to measure gage pressure at transfer pump discharges.
14. Fuel Flow Switches (at hose reel enclosures): See Electrical Design Drawings
15. Quick Connect Couplings: Aluminum body cam and groove fitting with dust cap. Male fitting with ANSI 150-pound class flanged MPT or FPT connection, as shown, 150 psig minimum working pressure. PT Coupling or approved equal.
16. Cam Lock Couplings: Aluminum body cam and groove male fittings with FNTF connection, 150 psi minimum working pressure. Provide dust cap with Buna-N seal for each fitting provided. PT couplings or equal.
17. Dry break coupling: Aluminum body cam and groove fitting with dust cap with ANSI 150-pound class flanged, MPT, or FPT connection as shown on the Contract Drawings. 150 psig minimum working pressure. Each dry break coupling to include dust caps and appropriate adapters to connect to standard camlock fittings of the same size. PT Coupling Maxi-Dry Series MD20A or approved equal.
18. Strainers: Flanged, carbon steel body, bottom clean-out Y-strainer with #10 mesh and blow-off tapping plug. Mueller Fig. 781, or approved equal.
19. Utility Markers: Continuous glass fiber and resin reinforced marker, one-

piece, vandal and vehicle impact resistant. Provide Carsonite CUM 375 or approved equal.

2.4 PIPE SUPPORTS

- A. All pipe supports, clamps, fittings, and hardware shall be Stainless Steel.
- B. Support strut: Stainless Steel finish and slotted back unless specifically indicated otherwise.
 - 1. Standard strut: 12 gauge, 1-5/8 inch by 1-5/8 inch, Unistrut P1000T (SS), or approved equal.
 - 2. Double strut: 12 gauge, 1-5/8 inch by 3-1/4 inch, Unistrut P1001 (SS), or approved equal.
 - 3. Post Base: 1-5/8 inch by 1-5/8 inch, Unistrut P1887 (SS), or approved equal.
 - 4. Single Strut: 12 gauge, 1-5/8 inch by 1-3/8 inch, Unistrut P3000 (SS), or approved equal.
 - 5. Deep Strut: 12 gauge, 3-1/4 inch by 1-5/8 inch, Unistrut P5000 (SS), or approved equal.
 - 6. Shallow strut: 14 gauge, 1-5/8 inch by 13/16 inch, Unistrut P4100T (SS) or approved equal.
 - 7. Solid back strut: For welding to tanks or structures, 12 gauge, 1-5/8 inch by 1-5/8 inch, unfinished black steel, Unistrut P1000 (SS), or approved equal.
- C. Provide stainless steel fitting, brackets, channel nuts and accessories designed specifically for use with supplied strut.
- D. Pipe Clamps: stainless steel two-piece pipe clamp designed to support pipe tight to strut. Unistrut P1117E-SS and P1119E-SS or approved equals.
- E. Pipe Straps: stainless steel two-hole pipe strap. Unistrut P2558 (SS), no substitutes.
- F. Fasteners:
 - 1. Bolts, nuts and washers: Stainless steel unless galvanized is specifically shown. Stainless steel shall be: Type 316L.
 - 2. Lags: stainless steel unless galvanized steel is specifically shown. Stainless steel shall be: Type 316L.

2.5 PIPE AND PIPE SUPPORT COATINGS

- A. Coating processes shall be submitted to the engineer for approval prior to pipe coating.

B. Above Grade Steel Pipe:

1. Prime pipe and fittings prior to shipping from factory. Prepare outer pipe and fitting surfaces by wheel abrading or sandblasting to bare metal. Prime with universal red oxide primer (PPG Multiprime 4160 OAE) to 1.5 mils minimum DFT.
2. After field fabrication is complete, top coat primed pipe and fittings with two coats of ALKYD enamel (PPG HPC Industrial Alkyd 4308 OAE). Color shall be Safety Red for diesel piping and gray for gasoline piping.
3. Label all above grade piping as to contents and provide flow direction arrows in accordance with ASME A13.1. Arrows may be painted stencils or high quality printed stickers. Maximum flow direction arrow spacing shall be 10 feet measured along pipe length, minimum of one arrow per pipe segment. Color shall be black. Periodically label each pipe run every 50-feet.

C. Below Grade Steel Pipe:

1. Below grade pipe shall be coated with 17 mils minimum DFT fusion bonded epoxy coating, 3M Scotchkote 134 or approved equal.
2. Provide mastic line heat shrink sleeves at all joints and fittings. Raychem WPC 100 or approved equal for pipe joints and Rahchem Flexclad or approved equal for fittings.
3. Extend sleeves and overlap a minimum of 2-inches over pipe coatings.
4. Prior to backfilling, test coating with an electronic holiday detector. Repair all defects and retest

2.6 FUEL DISPENSERS AND APPURTENANCES

- A. Dual Product Dispenser: Dual Product Dispenser shall be UL listed mechanical, two hose, dual product (gasoline/diesel), single sided, dispenser for use with remote pumping unit. Dispenser shall be certifiable for retail fuel sales, all stainless steel panels, high hose retractor, internal 10 micron filter, 2-stage solenoid valve. Gasboy AtlasX 9153GXTW2 mechanical dispenser, no substitutes.
- B. Dispenser Appurtenances:
1. Retail Dispensing Facility Arctic Hose: Low temperature (-60 deg F) ¾ inch fuel dispensing hose, 300 psi working pressure, Goodyear Arctic Ortac, or approved equal. Provide hose swivels at each end.
 2. Retail Dispensing Facility Breakaway Coupling: UL listed, ¾ inch, breakaway fitting, EBW model 697-137 with hose connection, or approved equal.
 3. Retail Dispensing Shear Valve: 1-1/2" x 1-1/2" shear valve with fusible link. Morrison Bros. Co. model 636F, or approved equal.

4. Retail Dispensing Facility Hose Swivel: UL listed dispenser hose swivel. OPW model 45-5060, or approved equal.
 5. Retail Dispensing Hose Nozzle: UL listed, automatic shut-off, automotive fill nozzle with hold open rack and color coded handles (black for gasoline, green for diesel). OPW model 11BP-0400 and 11B-0100, or approved equal.
- C. Coatings: Dispenser structure, floor, and base shall be coated in accordance with 05 50 00. Bolts, nuts, and washers shall be hot dip galvanized in accordance with ASTM A153.

2.7 BULK FUEL TRANSFER EQUIPMENT

- A. Meters: Positive displacement meter rated for 60 gpm of continuous flow with a 150 psig working pressure. Accuracy shall be +/- 0.22% or better from 6-60 gpm. Provide 1-1/2-inch inlet and outlet companion flanges with o-ring seals, preset counter with direct mechanical linkage to shutoff valve, resettable register, non-resettable totalizer, air eliminator, strainer, microswitch for shutting down transfer pump, and 10 gallon dwell. All elastomeric seals shall be low temperature nitrile rubber (Buna-N). Factory calibrate for No. 1 diesel fuel, or unleaded gasoline as indicated.
1. Resettable registers shall have 0.1 gallon as the smallest division, preset counter with whole gallon increments only.
 2. Liquid Controls M-5-K-1 or approved equal.
- B. Fuel Filter (double element) Two (2) cartridge in-line filter with Buna-N gasket and grommets, 1 1/2" NPT inlet/outlet, 50 psig maximum working pressure 60 GPM capacity. CIM-TEK Centurion II or approved equal. Provide twelve (12) Buna-N gaskets (#90005), twelve (12) 30 micron hydro sorb type II (#30036), twelve (12) Buna-N grommets (#90006), twelve (12) filter cartridges (#90002), and two (2) replacement canisters.
- C. Fuel Filter (triple element) Three (3) cartridge in-line filter with Buna-N gasket and grommets, 2" NPT inlet/outlet, 50 psig maximum working pressure 90 GPM capacity. CIM-TEK Centurion III or approved equal. Provide six (6) Buna-N gaskets (#90005), six (6) 30 micron hydro sorb type II (#30036), six (6) Buna-N grommets (#90006), six (6) filter cartridges (#90002), and two (2) replacement canisters.
- D. Bulk Transfer Arctic Hose: 1 1/2 inch diameter with 1 1/2 inch NPT connections at each end. Provide 30 foot long section of hose with each hose reel assembly. Goodyear Arctic Ortac or approved equal.
- E. Retail Dispensing Shear Valve: 1-1/2" x 1-1/2" shear valve with fusible link. Morrison Bros. Co. model 636F, or approved equal.

- F. Bulk Transfer Breakaway Connection: UL listed 1 1/2-inch breakaway fitting, OPW model no. 66SP-5150 with custom fabricated 18-inch hose section, 1 1/2" NPT connections at each end.
- G. Hose Swivel: UL listed hose swivel. PT Coupling model FOB150MF, or approved equal.
- H. Hose Nozzle: UL listed automatic shut off, heavy duty, high flow fill nozzle with hold open latch. OPW 1290-0050, or approved equal.
- I. Hose Reel: Class 1, Div 1 rated, explosion proof spring rewind hose reel capable of holding 40 feet of 1 1/2 inch I.D. hose. Reel shall be top rewind. Hannay 922-23-24-10.5B (Top Rewind) with utility hose rollers and ball stop for 1 1/2 arctic hose, or approved equal.
- J. Static Grounding Reel: Enamel coated steel frame and reel with permanently sealed spring return. Provide with 50 feet of 1/8 inch galvanized carbon steel cable, minimum 100 ampere grounding clip, and stop ball. Hannay GR75, or approved equal.
- K. Cam Lock Couplings: Aluminum body cam and groove male fitting with FNPT connection, 150 psig minimum working pressure. Provide dust cap with Buna-N seal for each fitting provided. PT coupling, or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION OF PIPING AND FITTINGS

- A. General Provisions:
 - 1. Work includes all tank farm piping and distribution piping to and from marine or truck fill headers, bulk storage tanks, intermediate storage tanks, dispensers, and bulk transfer hose reels.
 - 2. All piping shall be fabricated and tested in conformance with ASME/ANSI B31.4.
 - 3. Diagrams: Piping diagrams are schematic only and must not be used for obtaining lineal runs or number and type of fittings.
 - 4. Offsets in Piping: The drawings do not attempt to show exact details of all piping. No extra payments will be allowed where obstructions in the work of other trades, or work under this contract, require offsets in piping.
 - 5. Openings in Pipes: Keep closed during the progress of the work.
 - 6. Installation of Valves: Install valves with stem horizontal or above the horizontal.
 - 7. Connections to Equipment: All piping connections to motor driven

equipment shall be made through flexible pipe connectors.

8. Short Pipe Connections: Close nipples are not permitted. For short pipe connections, use standard short nipples.
9. Make threaded joints using pipe joint compound applied to the male threads. Hercules Grip, no substitution.
10. Coat flange gaskets with anti-seize compound prior to assembly.
11. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
12. Flanged Connections: Make up joints with flanged faces true and perpendicular to the centerline of the pipe to which the flanges are attached. Bolts for flanged joints shall be steel square head machine bolts with heavy semi-finished hexagon nuts.
13. Flanges: Wherever welded piping connections to equipment, valves, or other units need maintenance, servicing or require possible removal, the connecting joint shall be flanged. Pressure rating of the pipe flanges shall match the pressure rating of the flanges on the equipment to which the piping connects.
14. Route piping in an orderly manner and maintain gradient
15. Group piping whenever practical at common elevations.
16. Install piping to allow for expansion and contraction without stressing pipe, joints or connected equipment. Install valves to allow full operation without obstruction of operating handle.
17. Support piping and equipment as shown on the drawings using specified supports and fasteners. If not detailed on the drawings, support from structural members with pipe hangers, clamps or pipe straps specifically intended for the application. Do not support piping from connections to equipment. Provide piping supports spaced per the following table.

<u>Pipe Size</u>	<u>Maximum Support Spacing</u>
1-1/2 inch	9 ft
2 inch	10 ft
2-1/2 inch	11 ft
3 inch	12 ft
4 inch	14 ft

18. Provide piping supports as shown and as required to adequately support piping. Touch up all cut ends and damaged surfaces of galvanized steel and zinc plated supports and fasteners with spray-on cold galvanizing compound. ZRC, or approved equal.

19. Do not use stainless steel in contact with galvanized supports.
 20. Label contents of all piping in accordance with ASTM A13.1
- B. Perform welding in accordance with ASME BPV, IX and API 1104. Welding procedures shall be submitted and approved. Visually inspect weld joints in accordance with API 1104. Welder shall be certified for the approved procedure and welder certification shall be submitted and approved.

3.2 INSTALLATION OF PIPING SPECIALTIES

- A. Install per manufacturer's recommendations.

3.3 UTILITY MARKERS

- A. Install utility markers every 50 feet along the pipeline outside diked areas.
- B. Utility markers shall not be installed on drivable surfaces of trails or roads. Markers shall be clearly visible and out of the way of vehicles and pedestrians.

3.4 PRESSURE TESTING

- A. Pressure Testing for Exterior Fuel Piping: Piping shall be pressure tested per ASME B31.4.
1. Notify PROJECT MANAGER in writing seven (7) days in advance of pressure tests. PROJECT MANAGER shall be present at all testing. Pressure testing performed without PROJECT MANAGER present will be rejected, unless prior written approval is received from PROJECT MANAGER.
 2. Pressure test requirements for above ground pipe:
 - a. Piping shall be tested prior to the application of coatings and the installation of valves, strainers, etc. Pressure test piping spools at 125 psi for a minimum of 1 hour or longer as required to visibly inspect all joints in the tested section for leaks.
 - b. After all piping, valves, and other equipment are installed a final pneumatic leak test shall be performed. Piping shall be pressure tested at 1.5 times the operating pressure or a minimum of 125 psi, whichever is greater, for a minimum of 4 hours. All joints shall be inspected for leaks.
 - c. Provide a minimum 4-inch diameter calibrated clock gauge with readings in 1 psi increments for pressure observation.
- B. Pressure Test Documentation: Provide test reports for all pressure tests required above. Submit a copy of each test report to the owner for

approval prior to covering pipe. All test reports shall include the following.

1. Date of Test.
 2. Identification of piping system tested.
 3. Test fluid.
 4. Test duration.
 5. Test pressure, ambient temperature, and time at start and finish.
 6. Certification of test equipment.
 7. Certification results by examiner.
- C. Before operating any equipment or systems, make thorough check to determine that systems have been flushed and cleaned as required and equipment has been properly installed, lubricated and serviced in accordance with factory instructions.

3.5 FUEL SYSTEM TESTS

- A. The entire fuel system shall be tested for leaks after installation and prior to operational testing of pumps, motor operated valves, fuel transfer control panels, etc.
- B. The Contractor shall perform operational testing of the entire fuel system to include but not limited to all pumps, motor operated valves, fill limiting valves, level switches, pressure switches, dispensing units, fuel transfer control panels, fuel dispensing controllers, cathodic protection systems, etc..

END OF SECTION

SECTION 33 52 23
BULK FUEL TRANFER PUMPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and the Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Follow all provisions of Section 33 05 00, "Common Work Results for Utilities."

1.2 WORK INCLUDED

- A. Work under this section shall include furnishing all labor, materials, tools, and equipment necessary for the complete installation of the pump system.

1.3 SUBMITTALS

- A. Submit each item specified in this Section according to the Conditions of the Contract and Division 01 Specification Sections and Section 33 05 00, "Common Work Results for Utilities".
- B. Shop Drawings: Indicate assembly, required clearances, and location and size of field connections.
- C. Product Data: Provide manufacturer's literature and data indicating rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.
- D. Manufacturer's Installation Instructions: Indicate rigging, assembly, and installation instructions.

1.4 QUALITY ASSURANCE

- A. Pumps procured from sources beyond territorial boundaries of the United States (including Alaska and Hawaii) will not be acceptable.
- B. The installing contractors shall have the necessary knowledge, skills and equipment to enable proper and safe pump installation.
- C. Storage: Protect pumps from dirt and moisture.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements. Manufacturers offering products that may be incorporated in the work include,

but are not limited to the following:

1. Pumps:
 - a. Gorman-Rupp.
 - b. Red Jacket.
 - c. STP.

2.2 PUMPS

A. Transfer Pumps:

1. Gray cast iron, self-priming centrifugal pump for petroleum service. 1-1/2 inch NPT inlet & outlet, bronze impeller, self-lubricated Buna-N mechanical seal. Close coupled to 3,450 rpm, 1 hp explosion proof motor, 230VAC, single phase. Pump shall produce 40 gpm at 40 feet total dynamic head. Gorman-Rupp Model 81-1/2D3-X1, No substitutes.
2. Gray cast iron, self-priming centrifugal pump for petroleum service. 2 inch NPT inlet & outlet, bronze impeller, self-lubricated Buna-N mechanical seal. Close coupled to 3,450 rpm, 2 hp explosion proof motor, 230VAC, single phase. Pump shall produce 68 gpm at 75 feet total dynamic head. Gorman-Rupp Model 02K3-X2, No substitutes.

- B. Submersible Pumps: 3/4 hp, 208-230v, single phase, explosion proof submersible turbine pump with intake screen and integral leak detection. Install pump intake to level shown on drawings. Provide Red Jacket NO. P75U1 with trapper intake screen, or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Check equipment for damage that may have occurred during shipment. Repair damaged equipment as approved or replace with new equipment.

3.2 INSTALLATION

- A. Install pumps and associated equipment in accordance with applicable codes and per manufacturer's installation instructions.
- B. Electrical installation shall be in accordance with NEC and Division 26 Specifications.

3.3 FUEL SYSTEM TESTS

- A. The entire fuel system shall be tested for leaks after installation and prior to operational testing of pumps, motor operated valves, fuel transfer control panels, etc.

- B. The Contractor shall perform operational testing of the entire fuel system to include but not limited to all pumps, motor operated valves, fill limiting valves, level switches, pressure switches, dispensing units, fuel transfer control panels, fuel dispensing controllers, cathodic protection systems, etc.

END OF SECTION

SECTION 33 56 13
ABOVE GROUND FUEL STORAGE TANKS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and the Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Follow all provisions of Section 33 05 00, "Common Work Results for Utilities".
- C. See project drawings and Section 01 64 00, "Receipt of Owner Furnished Materials" for tank quantities and locations.
- D. OWNER provided tank shop drawings will be provided upon request once they are available from the Tank Manufacturer.

1.2 WORK INCLUDED

- A. This section includes the furnishing of all labor, tools, equipment, and materials necessary to fabricate, coat, package for shipment, deliver, and install the appropriate number of the following tanks in accordance with the awarded Contract schedule(s):
 - 1. OWNER PROVIDED new thirty thousand (30,000) nominal gallon, single wall, horizontal, steel, skid mounted, aboveground bulk storage tanks for diesel and gasoline service. Outer tank dimensions shall be in accordance with the Contract Drawings and Shop Drawings.
 - 2. OWNER PROVIDED five thousand (5,000) nominal gallon, two product, protected, horizontal, steel, skid mounted, above ground bulk storage tanks for gasoline and diesel service. Outer tank dimensions shall be in accordance with the Contract Drawings (UL142 & 2085).
 - 3. CONTRACTOR PROVIDED new five hundred (500) nominal gallon, single wall, horizontal, steel, stand mounted, aboveground storage tanks for diesel service. Outer tank dimensions shall be in accordance with the Contract Drawings and Shop Drawings.
 - 4. ALL TANK APPURTANCES for OWNER provided and Contractor Provided tanks.

1.3 SUBMITTALS

- A. Submit each item specified in this Section according to the Conditions of the Contract and Division 01 Specification Sections and Section 33 05 00, "Common Work Results for Utilities".

- B. Submit shop drawings for the following components:
 - 1. Submittals shall include all tank appurtenances including but not limited to pumps, tank liquid level indicators, normal/emergency vents, sample hatches, overfill prevention valves, high/low level alarms, pump control panel, etc.
 - 2. Submit material lists with catalog cuts for any proposed substitutions.
 - 3. Quality Control Plan.
 - 4. Tank Painting Schedule.

1.4 REFERENCED STANDARDS

- A. American National Standards Institute (ANSI):
 - 1. B1.20.1, Pipe Threads, General Purpose (Inch).
- B. American Society for Testing Materials (ASTM):
 - 1. A53, Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - 2. A105, Specification for Forgings, Carbon Steel, for Piping Components.
 - 3. A106, Standard for Seamless Carbon Steel Pipe.
 - 4. A181, Forgings, Carbon Steel, for General Purpose Piping.
 - 5. A183, Carbon Steel Track Bolts and Nuts.
 - 6. A234, Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
- C. American Society of Mechanical Engineers (ASME):
 - 1. ASME B31.4, Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids.
 - 2. ASME B31.9, Building Services Piping.
 - 3. B16.3, Malleable-Iron Threaded Fittings.
 - 4. B16.5, Pipe Flanges and Flanged Fittings.
 - 5. B16.34, Valves—Flanges, Threaded, and Welding End.
 - 6. B16.39, Pipe Unions, Malleable Iron Threaded.
- D. Underwriters Laboratories (UL):

1. UL 142, Steel Aboveground Storage Tank Installation & Testing.
 2. UL 2085, Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids
- E. National Fire Protection Association (NFPA):
1. NFPA 30/30A Flammable and Combustible Liquids Code.
 2. NFPA 31, Standard for the Installation of Oil Burning Equipment.

1.5 QUALITY ASSURANCE

- A. Piping, fittings, and valves manufactured or procured from sources beyond territorial boundaries of the United States will not be acceptable.
- B. The installing contractors shall have the necessary knowledge, skills and equipment to enable proper and safe above ground storage tank installation.
- C. Tank Handling: To prevent damage to the tank, equipment to handle the vessel shall be of adequate size to lift and lower the tank without dropping or dragging.
- D. Tank Storage: If the tank must be temporarily stored prior to installation, it shall be placed in an area away from activity where tank damage could occur. Factory-installed protective padding material should remain in place until the tank is ready to be lowered in the excavation.
- E. Comply with all applicable city and state codes and ordinances. In case of conflict with drawings or specifications, the codes and ordinances shall govern.
- F. Tank manufacturers shall have a minimum of 10 years experience including the manufacture of at least five similar tanks in the previous three years.
- G. Tank Leak Test: Provide tank integrity testing in the form of a hydrostatic test or other approved method in accordance with UL 142.

1.6 DRAWINGS

- A. Contract Drawings are diagrammatic and show the general design, arrangement, and extent of the facility. Due to the small scale of the drawings it is not possible to show all offsets, fittings, and accessories which may be required. Contractor shall carefully investigate the field conditions and work requirements for all trades and arrange accordingly.
- B. Contractor is responsible for verifying drawing dimensions by making field measurements and preparing separate shop drawings.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Materials and apparatus shall be new unless otherwise specified, and each shall have all necessary accessories to make it functionally complete. All items of the same type shall be of the same manufacturer.
- B. Tank manufacturer to provide shop-welded standoffs as required for bolting on appurtenances in the field.

C. FIELD WELDING TO TANKS IS PROHIBITED.

2.2 30,000 GALLON SINGLE WALL BULK STORAGE TANKS

- A. 30,000 gallon tanks shall be OWNER furnished and Contractor installed. All tank appurtenances shall be provided by the Contractor and installed in the field.
- B. Tank Appurtenances for 30,000 Gallon Tank:
 - 1. Provide all tank appurtenances as required by applicable codes. Appurtenances shall include fill tubes & internal piping.
 - 2. Labeling: Provide labeling on tank in accordance with the International Fire Code and NFPA 704, including but not limited to product identification, tank number, hazard classification, compartment storage capacity, etc.
 - 3. Provide external ladder and catwalks for access to tank mounted equipment as indicated on the project drawings.
 - 4. Provide atmospheric and emergency venting for the tank in accordance with UL 142.
 - a. Primary Tank Combination Atmospheric Vent/Alarm: Threaded 3" pressure/vacuum vent with integral whistle overfill alarm set to activate at 6 oz/sq. inch pressure. Provide Morrison Bros., Co Fig 922, or approved equal. Set whistle to start at 90% of tank capacity.
 - b. Primary Tank Emergency Vent: Aluminum body, flanged connection emergency vent set to open at 16 oz/sq. inch pressure. Emergency vent shall be sized in accordance with UL142. Morrison Bros, Co. Model 244F, with flanged adapter, or approved equal. Loose manholes not permitted.
 - 5. Liquid Level Clock Gauge: Stainless Steel float operated clock gauge with readout in feet and inches, up to 12 feet in ¼" increments installed in stilling well. Morrison Bros, Co. Model No. 818, or approved equal.

6. Gauge Hatch: Brass cap, brass adapter, and brass chain, Buna-N gasket, 2-inch FPT connection. Morrison Figure 307, or approved equal.
7. Float Switches: See "Electrical Equipment Schedule" in the Contract Drawings. Note that the 3 & 4 position floats are used in conjunction with the control panel.
8. See project drawings for further specifications and requirements.

2.3 5,000 GALLON PROTECTED TWO PRODUCT DISPENSING TANK

- A. 5,000 gallon tanks shall be OWNER furnished and Contractor installed. Contractor shall confirm salvageable appurtenances available onsite and provide new components as required.
- B. Tank Appurtenances for 5,000 Gallon Tank:
 1. Provide all tank appurtenances as required by applicable codes. Appurtenances shall include fill tubes & internal piping.
 2. Labeling: Provide labeling on tank in accordance with the International Fire Code and NFPA 704, including but not limited to product identification, hazard identification, tank numbering, compartment storage capacity, etc.
 3. Provide external ladder and catwalks for access to tank mounted equipment as indicated on the project drawings (Owner furnished, Contractor installed).
 4. Provide atmospheric and emergency venting for the storage tank in accordance with UL 142.
 - a. Primary Tank Combination Atmospheric Vent/Alarm: Threaded 2" pressure/vacuum vent with integral whistle overfill alarm set to activate at 6 oz/sq. inch pressure. Provide Morrison Bros., Co Fig 922, or approved equal. Set whistle to start at 90% of tank capacity.
 - b. Emergency Vents: Aluminum body, flanged connection emergency vent set to open at 16 oz/sq. inch pressure. Emergency vent shall be sized in accordance with UL142. Morrison Bros, Co. Model 244F, with flanged adapter, or approved equal. Loose manholes not permitted.
 5. Liquid Level Clock Gauge: Stainless Steel float operated clock gauge with readout in feet and inches, up to 12 feet in 1/4" increments installed in stilling well. Morrison Bros, Co. Model No. 818, or approved equal.
 6. Gauge Hatch: Brass cap, brass adapter, and brass chain, Buna-N gasket, 2-

- inch FPT connection. Morrison Figure 307, or approved equal.
7. Submersible Pump: See section "33 52 23 Liquid Fuel Pumps".
 8. Fill drop tube, 2-inch shop fabricated.
 9. Float Switches: See "Electrical Equipment Schedule" in the Contract Drawings. Note that the 3 & 4 position floats are used in conjunction with the control panel.
 10. See project drawings for further specifications and requirements.

2.4 500 GALLON DAY TANK

- A. 500 gallon tank shall be Contractor furnished and Contractor installed. All tank appurtenances shall be provided by the Contractor and installed in the field.
- B. Tank Appurtenances for 500 Gallon Tank:
 1. Provide all tank appurtenances as required by applicable codes. Appurtenances shall include fill tubes & internal piping.
 2. Labeling: Provide labeling on tank in accordance with the International Fire Code and NFPA 704, including but not limited to product identification, hazard identification, tank numbering, compartment storage capacity, etc.
 3. Provide external ladder for access to tank mounted equipment as indicated on the project drawings.
 4. Provide atmospheric and emergency venting for the storage tank in accordance with UL 142.
 - c. Primary Tank Vent: Aluminum tee-style body, 20 mesh stainless steel screen, 2-inch FPT connection. Morrison Figure 155, OAE.
 - d. Emergency Vents: UL listed, aluminum body, brass seat, cast iron cover, flanged connections, sized in accordance with UL 142. 8 ounces per square inch pressure setting. Morrison Bros Model 244 with companion flange for vents 6 inches or smaller, OAE.
 5. Liquid Level Clock Gauge: Stainless Steel float operated clock gauge with readout in feet and inches, up to 12 feet in $\frac{1}{4}$ " increments installed in stilling well. Morrison Bros, Co. Model No. 818, or approved equal.
 6. Overfill Prevention Valve: 2-inch NPT float-type mechanical shut-off valve. Anodized aluminum body, closed cell Buna-N float, brass plunger, stainless steel linkage. Provide adapter for installation on a 4" NPT pipe nozzle with 2" FPT inlet. Provide with aluminum drop tube cut to length at 45 degrees as required to terminate 6 inches above tank bottom. Morrison Figure 9095-AA

or approved equal.

7. Water draw drop tube, 1-inch shop fabricated.
8. See project drawings for further specifications and requirements.

2.5 TANK COATINGS FOR EXTERNAL TANK SURFACES

- A. The tank exterior, saddles, and skids shall be shop coated as provided by the OWNER. Touch-up paint shall be provided by the CONTRACTOR in accordance with the following specification. All work to be done in accordance with the coating manufacturer's recommendations.
 1. Touch-up Paint: Provide 10 gallons each (30 gallons total) of prime, intermediate, and top coat coatings. The touch-up coating shall be color matched to coatings applied to the tanks. See Appendices for coating specifications.

PART 3 - EXECUTION

3.1 INSTALLATION OF ABOVEGROUND TANK

- A. General: Comply with current edition of Steel Tank Institute Standard No. R912 and R931, Contract Drawings and manufacturers written instructions.
- B. Site Preparation: Site shall be properly graded to provide drainage of surface water and prevent stagnant water under or around the tank.
- C. The tank shell shall be maximum 12-inches above finished grade. Infill between tank foundation elements with classified fill as required.
- D. Testing: Before placing tank in service, conduct on-site air pressure tests on both the inner tank and the secondary containment in accordance with UL 142 or approved test method.
- E. Touch up painting: After final placement and setting of tank, and after all connections to/from the tank and all appurtenances have been installed, tank paint is to be touched up using the touch up paint provided by the manufacturer or as indicated under tank coatings requirements in this section.
- F. Tank shall be electrically grounded.

END OF SECTION

SECTION 33 71 01

OVERHEAD ELECTRICAL DISTRIBUTION

PART 1 - GENERAL

1.1 SCOPE

- A. This Specification describes the minimum acceptable standards for overhead distribution line construction. All construction work shall be done in a thorough and workmanlike manner in accordance with the Drawings, Staking Sheets, specifications, and the standards specified herein.
- B. Any modified RUS Construction Units or any new construction units are included on the detail sheets in the Drawings. Any standard RUS Construction Units referenced on the Drawings or Staking Sheets shall be obtained by the Contractor. The lack of having the correct RUS construction unit drawing will not be acceptable as an excuse for an incorrect installation.
- C. The Drawings, Specifications, and Staking Sheets are complementary; what is shown on one is as binding as if called for in all. Do not scale the drawings. Locations of devices and equipment are approximate unless dimensioned.

1.2 RELATED REQUIREMENTS

- A. Division 1.
- B. Division 2.
- C. Division 31.
- D. Section 33 05 00 - Common Work Results for Utilities.
- E. Section 33 71 16 - Wood Electrical Utility Poles.

1.3 CODES AND STANDARDS

- A. Codes: Perform all work in strict accordance with all applicable national, state, and local codes; including, but not limited to the latest legally enacted editions of the following specifically noted requirements:
 - 1. ANSI-C2, National Electrical Safety Code – NESC.
 - 2. RUS Bulletin 1728F-804, Specifications and Drawings for 12.47/7.2 kV Line Construction, the Staking Sheets, Drawings and Specification, and Construction Drawings.

1.4 QUALITY CONTROL

- A. All material shall be Rural Utility Service (RUS) approved and accepted.
- B. All construction work shall be done in a thorough and workman-like manner in accordance with RUS Bulletin 1728F-804, Specifications and Drawings for 12.47/7.2 kV Line Construction, the Staking Sheets, Drawings and Specification, and Construction Drawings. The Contractor shall obtain a copy of these specifications and shall keep them on the jobsite.

- C. This specification supplements the RUS Bulletins identified above. Where there is a conflict, the more stringent condition shall apply. In general, standard RUS construction unit drawings have been used. However, several construction units have been modified. These construction units are included on the Drawings and have been identified with a modifier and shall be used in lieu of the similar RUS construction unit.
- D. Work shall be performed to the latest adopted Edition of the National Electric Safety Code (NESC) except where local regulations or the specifications or Drawings are more stringent, in which case the specifications and/or Drawings and the local regulations shall govern.

1.5 SUBMITTALS

- A. Shop Drawings and Product Data: Provide in accordance with Section 33 05 00 - Common Work Results for Utilities and Division 1.
- B. Submit Product Data for each unique item and each conductor type.
- C. In addition to Product Data the Contractor shall submit the sag and tension method to be used and the associated sag tables for the conductors.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Products shall conform to the following requirements. Items of the same classification shall be identical, including equipment, assemblies, parts, and components.
- B. Material and equipment shall be the standard product of a manufacturer regularly engaged in the manufacture of the product.

2.2 INSULATORS

- A. All insulators shall meet ANSI C29.
- B. Post or pin insulators shall be ANSI Class 55 rated minimum 15 kV, polymer, tie top. Contractor shall determine the neck size for the conductor provided. Preformed Line Products, or approved equal.
- C. Spool insulators shall be polymer, ANSI Class 53. Preformed Line Products, or approved equal.
- D. Deadend insulators shall be 15 kV, ANSI Class DS, fiberglass core, silicone housing. Provide clevis and tongue fittings as required.
- E. Insulators shall be selected to properly accommodate the armor rod installed on the conductor.

2.3 CROSSARMS

- A. Crossarms shall meet the requirements of RUS Spec. No. DT-5B:PE-16 solid wood, distribution type, and a 1/4 inch, 45° chamfer on all top edges. Crossarms shall be full-length pressure treated using a pressure injection method approved by

the Western Wood Preserves Institute. Pressure treatment shall be by the DCOI (4,5-Dichloro-2-N-Octyl-4-Isothiazolin-3-One) process in accordance with AWWA C4. Other treatment processes will not be accepted.

- B. Crossarm gains shall meet ANSI C135.33 requirements.
- C. Crossarms shall be 8 feet in length, unless otherwise required by the Contract Documents. Crossarms shall be machined, chamfered, trimmed, and bored for stud and bolt holes before pressure treatment. Factory drilling shall be provided for pole and brace mounting, for four pin or four vertical line-post insulators, and for four suspension insulators, except where otherwise indicated or required. Drilling shall provide required climbing space and wire clearances. Crossarms shall be straight and free of twists to within 1/10-inch per foot of length. Bend or twist shall be in one direction only. Crossarms shall have a stamp or nameplate indicating manufacturer, year of manufacture, species of wood, and type of treatment, and grade (close grain or dense).
- D. Crossarm braces shall be selected for the crossarm length and shall be full-length pressure treated using a pressure injection method approved by the Western Wood Preserves Institute. Pressure treatment shall be by the DCOI (4,5-Dichloro-2-N-Octyl-4-Isothiazolin-3-One) process in accordance with AWWA C4. Other treatment processes will not be accepted.

2.4 FUSED CUTOUTS

- A. Primary-fuse cutouts shall be 15 kV, 110 kV BIL, 100A loadbreak open type construction, polymer. NEMA B, heavy duty, 10 kA, for crossarm mounting. Open-link cutouts are not acceptable. Fuses shall be the dropout type. Fuse cutouts shall be equipped with combination mounting brackets for cutout and surge arrester, suitable for the indicated installations.
- B. Hubbell Power Systems, or approved equal.

2.5 GANG OPERATED LOAD BREAK SWITCHES

- A. Load break switches shall meet ANSI C37.30 standards and shall be rated 15kV.
- B. Gang-operated load break switches shall be of the outdoor, manually operated, three-pole, single-throw type with rotating insulators and equipped with interrupters capable of load break and load make equal to switch's continuous current rating. Each switch shall be suitably preassembled for the indicated configuration and mounting. Moving contacts shall be of the high-pressure, limited area type, designed to ensure continuous satisfactory contact.
- C. The three-phase switch shall be provided with reverse loop contacts to allow high contact pressure to be maintained during fault conditions.
- D. Switches shall be complete with necessary operating mechanisms, handles, and other items required for manual operation from the ground, as indicated on the drawings.
- E. The control rod shall be sized and provided to properly operate the three-phase switch.

- F. Switches shall be Cooper Power Systems M-Force three-phase switch, or Engineer approved equal, 600 amp, 15 kV, horizontal as indicated on the drawings, with cycloaliphatic insulators, steel crossarm, ice shields, and torsional handle. Contractor shall develop the catalog number for the switch from the description herein and from the Cooper Power System information and submit the complete catalog number with the product submittals.
- G. See Staking Sheets for additional requirements.

2.6 CURRENT TRANSFORMERS

Outdoor current transformers shall be ABB, Type BB-15-971(H), or approved equal. Current transformer shall be 15 kV, 110 kV BIL and shall have a secondary rating of 5 amps with a primary rating as indicated on the drawings.

2.7 POTENTIAL TRANSFORMERS

Outdoor potential transformers shall be ABB, Type VOG-11, or approved equal. Potential transformers shall be rated 15 kV, 110 kV BIL and shall have a thermal rating of 1000 VA @ 30° C. Potential transformers shall have a single centered bushing with a primary voltage of 7,200 volts and a secondary voltage of 120 volts with a 60:1 winding ratio.

2.8 SURGE ARRESTERS

- A. Surge arresters shall be 7.65 kV, 9 kV duty cycle, distribution class, MOV type requiring no gap adjustment. Hubbell PDV-100, no. 213708, or approved equal.
- B. Surge arresters shall be provided for protection of aerial-to-underground transitions, gang-operated load-interrupter switches, transformers and other indicated equipment.
- C. Surge arrestors shall meet NEMA LA1 requirements for the zinc-oxide type and shall be suitable for outdoor installations. Arresters shall be equipped with mounting brackets suitable for the indicated installations.

2.9 POLE LINE HARDWARE

- A. Zinc-coated hardware material shall meet ANSI C135.1, C135.14, C135.17, C135.22, and C135.33 requirements.
- B. Steel hardware material shall meet ASTM A575 and A576 requirements.
- C. All hardware shall be hot-dip galvanized in accordance with ASTM A153.
- D. All curved washers shall be cast ductile iron.

2.10 GROUNDING

- A. All grounding material shall be copper or bronze. Aluminum material shall not be used.
- B. All below grade connections shall be made using the exothermic weld metal method.

2.11 GUY ASSEMBLIES

- A. Guy material shall be minimum 7 strands, 3/8" nominal diameter, Class A zinc-coated-steel extra high-strength meeting ASTM A475 requirements, with a

minimum breaking strength not less than 15,400 pounds or as indicated on the Drawings.

- B. Guy assemblies, including insulators and attachments, shall provide a strength exceeding the required guy strength. Thimbles or thimble-eyes shall be provided on anchor points. Guy hook guy attachments shall be Hubbell catalog number GH5N, or approved equal.
- C. Holding capacities for down guys shall be based on a lead angle of 45 degrees as indicated. When field conditions prevent indicated lead angles, anchors shall be placed in other locations as approved by the Authority.
- D. Guy deadends shall be made by using Preformed Line Products Guy-Grip deadend, or approved equal. Deadends shall be selected to equal or exceed the rating of the RUS unit referenced in the Staking Sheets.

2.12 GUY MARKERS

- A. Guy markers shall be full round, 2-inch by 8 feet long, yellow. Markers shall be made of high density polyethylene with ultra-violet light resistance additives to protect the resin and the color from brittleness and fading. Provide vandal resistant type. Securely clamped to the guy at the bottom and top of the marker.
- B. Install red striped reflective tape on both sides of the guy guard. Install in warm environment to allow for proper adhesion.

2.13 SPLICES AND DEADENDS

- A. All splices shall be full tension automatic type, Fargo GL406A, or approved equal.
- B. Primary deadends shall be clamp type dead end shoe, Hubbell PG46N, or equal. Deadends shall be full tension rated for the conductor.
- C. Secondary and service conductors shall be deadended using Preformed Line Products service grip deadends, suitable for the conductor provided.

2.14 POLE NUMBERS

Pole numbers shall be 2-inch high aluminum embossed with Roman typeface. Attached to pole with aluminum barbed round head nail. Pole numbers shall match the associated location in the Staking Sheet.

2.15 POLE REFLECTORS

Where indicated, install a minimum of 4 reflectors vertically on the pole. Reflectors shall be red, aluminum, 3-inch two hole mounting, acrylic.

2.16 PRIMARY OVERHEAD CONDUCTORS

- A. All primary conductors shall be bare overhead, Aluminum Conductor Steel Reinforced (ACSR). Conductors shall conform to the following standards.
 - ASTM B230: Aluminum Wire, 1350-H19 for Electrical Purposes
 - ASTM B231: Aluminum Conductors, Concentric-Lay Stranded.

ASTM B232:	Aluminum Conductors, Concentric-Lay Stranded, Coated Steel Reinforced (ACSR).
ASTM B498:	Zinc Coated (Galvanized) Steel Core for Use in Overhead Electrical Conductors.
ASTM B500:	ASTM Standard Specification for Metallic Coated Stranded Steel Core for Aluminum Conductors, Steel Reinforced (ACSR).

- B. Each primary cable shall be provided in the sizes indicated in the Staking Sheets or on the Drawings. Cables shall be provided based on the standard Code Word for the specific cable size, i.e. #1/0 ACSR shall be Raven.
- C. The conductors shall be capable of withstanding normal handling incident to manufacture, shipment, and field installation without being deformed or abraded. Such handling includes reeling, lifting and movement of full reels, unreeling, pulling through controlled tension stringing equipment, over stringing sheaves, compression fittings and other standard accessories as required.
1. The conductor shall be Class AA stranding in accordance with Table 1 of ASTM B232.
 2. The conductor size and number of wires shall be as specified herein.
 3. The aluminum wire shall be made of 1350-H19 aluminum alloy in accordance with ASTM B230. The minimum average conductivity of the aluminum shall not be less than 61.2% IACS.
 4. The zinc-coated (galvanized) steel core wire (Class A weight coating) shall be in accordance with ASTM B498. The minimum average conductivity of the steel shall not be less than 8% IACS.
 5. The component conductors shall be made with standard right hand lay.
- D. All tension tests shall meet or exceed ASTM B498, B230, and B232. The surface of the conductors shall remain smooth, free from points, sharp edges, abrasions, or other departures from smoothness that would tend to increase radio interference and corona loss. The conductors shall be free from excessive amounts of grease, metal particles, dirt, or other foreign matter. The conductors shall not deform from the cylindrical form nor shall longitudinal smoothness be affected by strand movement when subjected to tension. Conductor components shall be formed so that there is no slack in the outer layer.
- E. Sag and Tension and Stringing Tables.
- The Contractor shall provide a sag table and stringing table for each conductor based on the following information prior to stringing any conductor. All costs associated with these tables shall be included in the cost of the conductor. Contractor shall submit the sag and stringing table for review.

1. Design Conditions:
 - a. NESC Heavy Loading District, 130 mph wind.
 - b. Ruling Span: 160 feet.
 - c. Tension:
 - i. Initial Tension: 15% of Conductor Tensile Strength.
 - ii. Final Tension: 25% of Conductor Tensile Strength.
 - iii. Maximum Tension: 50% of Conductor Tensile Strength.
 2. Creep is not a factor.
 3. Stinging table shall provide sag and tensions at spans of 100 feet to 300 feet at a temperature range of -40° F to 100 ° F.
- F. The MANUFACTURER shall use a statistically based quality control sampling and testing plan to assure acceptable quality levels. As a minimum, sampling and testing shall be as required by ASTM B230, ASTM B232, and ASTM B498.
- G. Provide a certificate of compliance, signed by an authorized employee of the MANUFACTURER, that the material shipped meets the requirements of this specification and any supplementary requirements cited in a contract or order under which it was purchased.

2.17 SECONDARY OVERHEAD CONDUCTORS

- A. All secondary conductors shall be overhead service drop, multiplex, aluminum, 600 volt, 75° C rating, polyethylene insulated conductors. For each assembly, provide insulated conductors as indicated and an ACSR concentrically stranded neutral messenger. Conductors shall conform to the following standards.
- B-230: Aluminum Wire, 1350-H19 for Electrical Purposes.
- B-231: Aluminum Conductors, Concentric-Lay-Stranded.
- B-232 Aluminum conductors, Concentric-Lay-Stranded, Coated Steel Reinforced (ACSR).
- B-399: Concentric-Lay-Stranded 6201-T81 Aluminum Alloy Conductors.
- ICEA S-61-402
- B. Each multiplex cable shall be provided in the sizes indicated in the Staking Sheets or on the Drawings. Cables shall be provided based on the standard Code Word for the specific cable. Cables shall be provided as follows:
1. Duplex Conductors:

Cables utilized for lighting or other 120 volt service. Cable shall consist of one insulated conductor and one neutral.

2. Triplex Conductors:

Cables utilized for single phase service or other uses as indicated on the Drawings. Cable shall consist of two insulated conductors and one neutral ACSR.

3. Quadruplex Conductors:

Primarily used for three-phase service. Shall be provided with three insulated conductors and one neutral ACSR. Conductors shall be marked for easy phase identification.

2.18 SUPPORT BRACKETS AND TRANSFORMER MOUNTS

Support mounts for three-phase transformer installations shall be Aluma-form wing cluster mounts, model 3MW-24-M-L. Cluster mounts shall be suitable for the transformers installed.

2.19 PRIMARY METER MOUNTS

Primary meter mounts shall be Aluma-form, Model PMM-6 (3 Position) for mounting six pieces of equipment, or as indicated on the drawings.

PART 3 - EXECUTION

3.1 GENERAL

- A. Materials to be used for construction are designated by one or two lower-case alphabetic characters shown on the Drawings and in the "ITEM" column in the drawing material blocks. For example, "b" designates a steel, pole top pin.
- B. Normally crossarm pins and post-type insulators come equipped with washers and locknuts. Thus, the washers and locknuts for crossarm pins are not tallied in the "QTY" (quantity) columns in the material boxes on the Drawings. However, the crossarm pin washers and locknuts are shown on the Drawings in parenthesis to depict proper construction. If crossarm pins or post type insulators are purchased without washers, locknuts or studs, the quantity totals in the material boxes on the Drawings will need to be adjusted accordingly.
- C. Locknuts shall be installed on all threaded material and hardware in addition to nuts and washers. The threads on installed bolts shall protrude past the lock washers a minimum of one inch but not more than two inches.

3.2 DISTRIBUTING POLES

In distributing the poles, large, choice, close-grained poles shall be used for transformers, deadend, angle, and corner poles.

3.3 SETTING POLES

- A. All poles shall be direct buried as indicated on the Drawings.
- B. All direct buried poles shall be set to RUS specifications plus one foot. The minimum depth for setting poles shall be as follows:

MINIMUM POLE SETTING DEPTH	
LENTH OF POLE (FT)	SETTING IN SOIL (FT)
30	6.5
35	7.0
40	7.0
45	7.5

- C. On sloping ground, the depth of the hole shall be measured from the low side of the hole.
- D. Poles shall be set so that alternate crossarm gains face in opposite directions, except at terminals and deadends where the gains of the last two (2) poles shall be on the side facing the terminal or deadend. On unusually long spans, the poles shall be set so that the crossarm comes on the side of the pole away from the long span. Where pole top pins are used, they shall be on the opposite side of the pole from the gain, with the flat side against the pole.
- E. Poles shall be set in alignment and plumb except at corners, terminals, angles, junctions, or other points of strain, where they shall be set and raked against the strain so that the conductors shall be in line. Vertical angle structures (A3, B3, C3) shall be offset from centerline by the length of the insulator string hardware, to prevent adjacent poles from leaning into the angle.
- F. Poles shall be raked against the conductor strain not less than one inch for each ten feet of pole length, but not more than two inches for each ten feet of pole length after conductors are installed at the required tension.
- G. Pole backfill shall be thoroughly tamped the full depth. Excess dirt shall be banked around the pole.

3.4 OVERHEAD CONDUCTOR INSTALLATION

- A. Conductors shall be handled with care. Conductors shall not be tramped on nor run over by vehicles. Each reel shall be examined and the wire shall be inspected for cuts, kinks, or other injuries. Injured portions shall be cut out and the conductors spliced. The conductors shall be pulled over suitable rollers or stringing blocks properly mounted on pole or crossarm if necessary to prevent binding while stringing.
- B. The neutral conductor should be maintained on one side of the pole for tangent construction and for angles not exceeding 30°.
- C. With pin-type insulators the conductors shall be tied in the top groove of the insulator on tangent poles and on the side of the insulator away from the strain at

angles. Pin-type insulators shall be tight on the pins and on tangent construction the top groove shall be in line with the conductors after tying in.

- D. For neutral and secondary conductors on poles, insulated brackets (Material Item 'da') may be substituted for the single and double upset bolts on angles of 0° to 5° in locations known to be subject to considerable conductor vibration. All conductors shall be cleaned thoroughly by wire brushing before splicing or the installation of a connector or clamp. A suitable inhibitor shall be used before splicing or applying connectors over aluminum conductor.

3.5 PHASING

- A. Distribution A phase shall always be at the top or at the extreme left, when viewed facing the load, with power source at your back.

3.6 SAGGING CONDUCTORS

- A. Conductors shall be sagged evenly and in accordance with the conductor manufacturers' recommendations. The air temperature at the time and place of sagging shall be determined by a certified etched glass thermometer.
- B. The sag of all conductors after stringing shall be in accordance with the conductor manufacturers' recommendations, except that a maximum increase of three (3) inches of the specified sag in any span will be acceptable. However, under no circumstances will a decrease in the specified sag be allowed.
- C. The conductor shall be tensioned above the initial sag conditions. After bringing conductor to proper sag, deadends shall be secured within 2 hours. Wire shall be tied to insulators within 48 hours.

3.7 CONDUCTOR TIES

- A. All ties used shall be pre-formed type as manufactured by Preformed Line Products and conductors shall be properly attached to insulators using preformed ties.
- B. Conductor ties shall be selected to properly accommodate the armor rod installed on the conductor.

3.8 GANG OPERATED LOAD BREAK SWITCHES

- A. Install switches in accordance with the manufacturer's instructions.
- B. Switches shall be horizontal or vertical as indicated on the drawings or staking sheets.
- C. Position the operating handle at no higher than 4'-0" above grade level. If necessary, the lower operating rod shall be cut and threaded or lengthened as required to comply with the final position of the operating handle.

3.9 GRADING OF LINE

When using high poles to clear obstacles such as buildings, foreign wire crossing, railroads, etc., there shall be no upstrain on pin-type insulators in grading the line each way to lower poles.

3.10 GUYS AND ANCHORS

- A. Guys shall be placed before the conductors are strung and shall be attached to the pole per the Specifications for Overhead Distribution Line Construction.
- B. All anchors shall be as indicated on the Drawings and specified herein.
- C. Guys shall be placed before the conductors are strung and shall be attached to the pole as shown in the Drawings.
- D. All anchors and rods shall be in line with the strain and shall be so installed that approximately six inches of the rod remain out of the ground. In cultivated fields or other locations, as deemed necessary, the projection of the anchor rod above the earth may be increased to a maximum of 12 inches to prevent burial of the rod eye. The backfill of all anchor holes must be thoroughly tamped the full depth.
- E. Guy bonding clamps shall be installed in the eyes of all anchor rods. All guys (primary & secondary) shall be effectively grounded according to REA/RUS specifications. On secondary poles, guys shall be bonded to the secondary neutral.

3.11 POLE LINE HARDWARE

- A. A locknut shall be installed with each nut, eye-nut, or other fastener on all bolts or threaded hardware such as insulator pins, upset bolts, double arming bolts, etc.
- B. Suitable washers shall be installed under boltheads and nuts on wood surfaces and elsewhere as required. Washers used on through-bolts and double-arming bolts shall be approximately 2-1/4 inches square and 3/16 inch thick. The diameter of holes in washers shall be the correct standard size for the bolt on which a washer is used. Square curved washers shall be used for down-guy attachments to pole. Washers for use under heads of carriage-bolts shall be of the proper size to fit over square shanks of bolts. Eye bolts, bolt eyes, eyenuts, strain-load plates, lag screws, guy clamps, fasteners, hooks, shims, and clevises shall be used wherever required to adequately support and protect poles, brackets, crossarms, guy wires, and insulators.
- C. A 3 inch by 3 inch (minimum), square, curved washer (item "d") shall be used abutting the pole when installing primary deadend, neutral deadend and guy assemblies directly to the pole. A 2-1/4 inch (minimum) square washer shall be placed under the shoulder of crossarm insulator pins whose surface area abutting the crossarm is less than 4 square inches.

3.12 SPLICES AND DEADENDS

- A. Conductors shall be spliced and deadended as indicated on the Drawings. There shall be not more than one (1) splice per conductor in any span and splicing sleeves shall be located at least ten (10) feet from the conductor support.
- B. No splices shall be located in grade B crossing spans nor in the adjacent spans.
- C. Splices shall be no closer than 1,000 feet from one another and there shall be no more than three splices per mile in any primary phase or neutral conductor.
- D. Splices shall be installed in accordance with the manufacturer's specifications and recommendations.

3.13 TAPS AND JUMPERS

- A. Jumpers and other leads connected to line conductors shall have sufficient slack to allow free movement of the conductors. Where slack is not indicated, it shall be provided by at least two (2) bends in a vertical plane, or one (1) in a horizontal plane, or the equivalent. In areas where aeolian vibration occurs, special measures to minimize the effects of jumper breaks shall be used as specified.
- B. All aluminum to aluminum connections shall be provided with a Belleville washer.
- C. Jumpers and other leads connected to line conductors shall have sufficient slack to allow free movement of the conductors. Where slack is not shown on the Drawings it will be provided by at least two (2) bends in a vertical plane, or one (1) in a horizontal plane, or the equivalent. In areas where aeolian vibration occurs, special measures to minimize the effects of jumper breaks shall be used as specified.
- D. All leads on equipment such as transformers, etc., shall be a minimum of #4 AWG bare, stranded copper conductors. No. 4 AWG stranded copper conductors shall be used from the primary line to a cutout and from the cutout to the transformer. Provide slack in the jumper to allow for movement in the conductors during windy conditions. Where aluminum jumpers are used, a connection to an unplated bronze terminal shall be made by splicing a short stub of copper to the aluminum jumper using a suitable aluminum compression sleeve.
- E. All primary jumpers shall consist of minimum #2 ACSR, or the size of the conductor, if larger.
- F. Pole tap assemblies shall be framed so that the source is on top and the load (tap) is below.
- G. In no case shall pin-type insulators be installed upside down to carry jumpers.

3.14 HOT LINE CLAMPS AND CONNECTORS

- A. Connectors and hot-line clamps suitable for the purpose shall be installed. On all hot-line clamp installations, the clamp and jumper shall be installed so that they are permanently bonded to the load side of the line, allowing the jumper to be de-energized when the clamp is disconnected.
- B. Hot-line clamps shall be used at single phase transformer connections beneath three-phase primary lines and where single phase primary taps or extends from a three-phase primary line. Where a hot line clamp is used install a stirrup clamp suitable for the conductor.
- C. Stirrups shall be aluminum, bolted with tin plated loop. Hubbell Power type AHLS, or approved equal. Size selected to fit the primary conductor and the hot line clamp.
- D. Connections to the main line shall be made with compression solderless connectors. Connectors to equipment shall be made with compression connectors bolted to the equipment pad. Tools and dies shall be as recommended by the manufacturer. An embossing die code or other standard method shall provide visible indication that a connector has been adequately compressed on the ground wire. Where ground wires are connected to aluminum-composition conductors, specially treated or lined copper-to-aluminum connectors suitable for this purpose shall be utilized.

- E. All conductors shall be cleaned thoroughly by wire brushing before splicing or installing connectors or clamps. A suitable oxidation inhibitor shall be applied before splicing or applying connectors over aluminum conductor.
- F. All insulated secondary to secondary connections shall be made using compression connectors which are already pre-insulated, or parallel groove connectors and plastic covers.
- G. Secondary connections at the polemount transformers shall be made up as indicated on the Drawings. Inhibitor compound shall be used in all mechanical (setscrew) connections.

3.15 ARMOR RODS

- A. Armor rods shall be provided for all ACSR conductors. Armor rods shall be installed at each insulator but will not be required at primary dead-end assemblies if aluminum or aluminum-lined zinc-coated steel clamps are used.
- B. Lengths and methods of fastening armor rods shall be in accordance with the manufacturer's recommendations. All armor rods shall be pre-formed round.
- C. The application of armor rods to the conductor shall be such that the center of the armor rods shall not deviate from the center of the conductor support by more than 2-1/2 inches.

3.16 SECONDARIES AND SERVICE DROPS

- A. Secondary conductors shall be multi-conductor service cable. The conductors shall be sagged in accordance with the manufacturer's recommendations.
- B. Conductors for secondary underbuild on primary lines will be insulated in those instances where prevailing conditions may limit primary span lengths to the extent that covered wires or service cables may be used. Service drops shall be covered wire or service cable.
- C. Secondaries and service drops shall be so installed as not to obstruct climbing space. There shall not be more than one splice per conductor in any span, and splicing sleeves shall be located at least ten feet from the conductor support. Where the same covered conductors or service cables are to be used for the secondary and service drop, they may be installed in one continuous run.
- D. #4 Service drops over 140' in length shall be solidly guyed.
- E. #2 Service drops over 100' in length shall be solidly guyed.
- F. Install a wrap of tape around multi-plex cable at ends, to prevent further unraveling. Where multi-plex cable is open-ended, fold leads back and tape to mainline. Also tape the rough edges of pre-formed grips to protect the insulated leads from abrasion caused by wind vibration.
- G. Secondary cable shall be installed: 16" below existing bare neutral and 4'10" down on poles intended for a future primary tangent or 6'1" down on poles intended for a future primary dead-end.

- H. Where both 240/120 volt 1-phase and a higher voltage (208 or 480 volt) 3-phase secondary are to be installed, the higher voltage circuit shall be attached at least 16" above the lower voltage circuit (up to 4/0 quadruplex over 1/0 triplex, 200' maximum span).

3.17 SERVICES

- A. Service entrance and riser shall be by the customer. Contractor shall install the service drop and make connections to the customer's service entrance conductors at the weatherhead. Contractor shall install service entrance deadend.

3.18 TRANSFORMERS

- A. Polemount transformers shall be installed and grounded according to REA/RUS specifications. Transformers shall have at least two connections from the tank to the multi-grounded neutral conductor.
- B. Insulated trainer brackets (material item "fo") shall be used at pole transformers to secure secondary multiplex cable leads to prevent chafing due to wind movement.
- C. Transformers internally wired for 120 Volt secondary shall be labeled "120V" with reflective tags, 2.5" minimum height.

3.19 CROSSARMS

- A. Crossarms shall be bolted to poles with 5/8-inch through-bolts with square washer with locknut at each end. Bolts shall extend not less than 1/8 inch nor more than 2 inches beyond nuts.
- B. On single crossarm construction, the bolt head shall be installed on the crossarm side of the pole. Single crossarms shall be placed on opposite sides of consecutive poles.
- C. Double crossarms shall be securely held in position as indicated on the RUS Construction Units. Each bolt shall be equipped with square washers with locknuts. Double crossarms shall be provided at dead-ends, and at angles and corners as indicated, to provide adequate vertical and longitudinal strength.
- D. Tangent Arms and Buck Arms: Tangent arms and buck arms shall be set at right angles to lines for straight runs and for angles 45° and greater. Tangent arms shall bisect angles of turns of less than 45°. Dead-end assemblies shall be used for turns where shown. Buckarms shall be installed, as indicated, at corners and junction poles.

3.20 BRACES

- A. Wood braces shall be used for crossarm supports, unless specified otherwise on the Drawings. Braces shall be Hughes Brothers type 2023 or 2045, size as indicated on the RUS Construction Units, or approved equal.
- B. Braces shall be bolted to arms with 3/8-inch carriage bolts with round or square washers with locknuts between boltheads and crossarms, and secured to poles with 1/2-inch by 4-inch lag screws after crossarms are leveled and aligned.

3.21 GROUNDING

- A. The ground wire shall be secured to the pole with copper coated staples. The staples on the ground wire shall be spaced two (2) feet apart except for a distance of eight (8) feet above the ground and eight (8) feet down from the top of the pole where they shall be six (6) inches apart.
- B. Ground rods shall be driven full length in undisturbed earth in accordance with the Drawings. The top shall be at least 12 inches below the surface of the earth.
- C. All equipment shall have at least two (2) connections from the frame, case or tank to the multi-grounded neutral conductor.
- D. The equipment ground, neutral wires, and lightning-protective equipment shall be interconnected and attached to a common ground wire.
- E. Ground wire sizes shall be not smaller than No. 4 AWG copper. All pole grounds shall be solid.
- F. Surge Arrester Grounding: Surge arresters shall be grounded. Ground resistance for distribution-class arresters shall be not more than 5 ohms. Ground wire connections shall be not less than #4 AWG for distribution arresters.
- G. Unless otherwise indicated, neutral conductors shall be grounded at each transformer. Also, neutral conductors shall be grounded at a point not exceeding every third pole, or as indicated in the Staking Sheets.

3.22 WOOD POLE STORAGE AND HANDLING

- A. Wood poles held in storage for more than 2 weeks shall be stored in accordance with ANSI 05.1. Poles shall be stacked on treated skids, so arranged as to support the poles without producing noticeable distortion to any of the poles and to allow free circulation of air. The height of the piles shall be limited so as to avoid damage to poles on the bottom layers. Poles shall be piled and supported in such a manner that all poles are at least 1 foot above general ground level and any vegetation growing thereon. No decayed or decaying wood shall be permitted to remain underneath stored poles.
- B. Handling of wood poles shall be in accordance with ANSI 05.1. Poles shall not be dragged along the ground. Cant hooks, pole tongs, or other tools capable of producing indentations of more than 1 inch in depth shall not be used in handling the poles.

3.23 TESTS

- A. The Contractor shall provide notification to the Authority a minimum of seven (7) calendar days in advance of performing tests. The Authority shall have the right to observe tests. Any tests performed without proper notification shall be repeated upon request of the Authority at no cost to the Authority.
- B. Operating Test: After the installation is completed, the Contractor shall conduct an operating test for approval. Equipment shall be demonstrated to operate in accordance with the requirements herein. Verify correct rotation throughout

system. Verify voltage at each service. Correct voltage at any service more than 5% above or below the nominal voltage.

- C. **Ground-Resistance Measurements:** Ground-resistance measurements shall be taken and certified by the Contractor. Certified test results shall be submitted to the Authority prior to energization of the distribution system. No part of the electrical distribution system shall be energized prior to the receipt of written approval from the Authority of the resistance testing of that system's ground rods and grounding systems. Test reports shall indicate the location of the ground point and grounding system and the resistance and the soil conditions at the time the test was performed. Ground-resistance measurements shall be made in normally dry weather with the ground under test isolated from other grounds. The resistance to ground shall be measured using the fall-of-potential method described in IEEE No. 142.
- D. **Sag and Tension Test**
1. The Authority reserves the right to witness the procedures used for ascertaining that initial stringing sags and tensions are in compliance with requirements for the applicable loading district and cable weight.
 2. The Contractor shall submit the sag and tension method to be used and the sag tables used to achieve the proper sag. The contractor shall wait a minimum of 2 hours after stringing the conductors to allow the conductors to stabilize prior to conducting the sag and tension tests. The contractor must complete the tests within 36 hours after stringing the conductors to avoid damaging the cable. Sagging operations shall not be conducted when wind conditions prevent satisfactory sagging.
 3. The span used to set the sag shall be called the sag-check span. The sag-check span shall be a level span and approximately equal to the ruling span.

END OF SECTION

SECTION 33 71 16
WOOD ELECTRICAL UTILITY POLES

PART 1 - GENERAL

1.1 SCOPE

This specification describes the minimum acceptable quality of wood poles. Where there is conflict between this specification and any other specification referred to herein, this specification shall govern. The poles shall be constructed in accordance with these specifications.

1.2 RELATED REQUIREMENTS

- A. Section 33 71 01 – Overhead Electrical Distribution

1.3 STANDARDS

All characteristics, definitions, and terminology, except as specifically covered in this specification, shall be in accordance with the latest revision of the following standards.

- | | |
|-------------------------|---|
| RUS Bulletin 1728F-700: | Specification for Wood Poles, Stubs, and Anchor Logs. |
| ANSI 05.1 | Wood Poles - Specifications and Dimensions. |
| AWPA-C4: | Poles - Preservative Treatment by Pressure Processes, American Wood Preservers Association. |

1.4 SUBMITTALS

- A. Shop Drawings and Product Data: Provide in accordance with Section 33 05 00 - Common Work Results for Utilities and Division 1.

PART 2 – PRODUCTS

2.1 WOOD POLES

- A. Wood poles shall meet the requirements of ANSI 05.1 and shall be Douglas Fir drilled and gained in accordance with RUS W1.1G Pole Framing Guide. Wood poles shall have pole markings located 10 feet from pole butts. Other locations will not be acceptable. Poles shall be machine trimmed by turning smooth full length, and shall be roofed, gained, and bored prior to pressure treatment. No climbing rungs shall be provided.
- B. Poles shall be full length pressure treated using a pressure injection method approved by the Western Wood Preserves Institute that prevents leaching. Pressure treatment shall be by the pentachlorophenol process in accordance with AWPA C4. Other treatment processes will not be accepted.
- C. Poles exhibiting any of the following defects will not be accepted; cross-breaks (horizontal cracks), catface (scars), compound through checks, decay, double sweep (poles having sweep in two planes), hollow butts or tops, improper framing, plugged holes (other than increment core holes), spike knots or any knot with bark inclusion, and split top.

D. Checks:

1. Checks (vertical cracks) are permitted in the top of pole except for any check more than 1/8 inch wide and extending down from the top of the pole more than 12 inches and within 30 angular degrees from the axis of the face of pole directly above ground; and any through checks or splits.
2. Through checks or splits in the butt surface of the pole are not permitted.
3. A check is considered to be continuous if it is not separated by at least 1/2 inch of wood. The maximum allowable width and length of any single check are found in Table I "Maximum Allowable Check Dimensions".

TABLE I. MAXIMUM ALLOWABLE CHECK DIMENSIONS

LENGTH OF POLE	MAXIMUM WIDTH	MAXIMUM LENGTH
30 feet	1/4 inch	5 inches
35 and 45 feet	5/16 inch	5 inches
50 feet and longer	3/8 inch	8 inches

E. Knots:

1. The diameter of any single knot or sum of the diameters of all knots shall not exceed the limits of Table II "Limits of Knot Sizes".

TABLE II. LIMITS OF KNOT SIZES

	Maximum Know Size Permitted		
	Diameter of Any Single Knot		Sum of diameters of all knots greater r than 0.5 inch in any 1-foot section
Length of Pole	Class H6 to 3 (Inches)	Class 4 to 10 (Inches)	All Classes
45 Feet and Shorter			
Lower Half of Length	3	2	1/3 of the average circumference of the same 1' section or 8", whichever is greater, but not to exceed 12" (Note 1)
Upper Half of Length	5	4	
50 Feet and Longer			
Lower Half of Length	4	4	1/3 of the average circumference of the same 1' section or 10", whichever is greater, but not to exceed 14" (Note 1)
Upper Half of Length	6	6	
<i>Notes:</i>			
1. Both upper and lower halves.			

PART 3 – EXECUTION

3.1 CERTIFICATION

- A. Provide a certificate of compliance, signed by an authorized employee of the producer, that the material shipped meets the requirements of this specification and any supplementary requirements cited in a contract or order under which it was purchased.
- B. Provide independent inspection certification.

END OF SECTION

SECTION 33 73 14

OVERHEAD LIQUID-FILLED TRANSFORMERS

PART 1 - GENERAL

1.1 SUMMARY

- A. This specification covers the electrical and mechanical characteristics of Single-Phase Overhead-Type Distribution Transformers. The transformers shall be designed and constructed in accordance with these specifications. All characteristics, voltage designations and tests shall be in accordance with the latest editions of ANSI Standards C57.12.26 and C57.12.00, except as modified herein.
- B. Transformers shall be designed in accordance with RUS requirements and shall be of new construction.
- C. The transformers will be non-evaluated units but shall be provided with minimum efficiencies as specified herein.
- D. Transformers shall be suitable for step-down service or step-up service as indicated in the Bid Schedule.
- E. Quantities and ratings shall be as indicated in the Bid Schedule.

1.2 RELATED REQUIREMENTS

- A. Section 26 05 00 Common Work Results for Electrical.
- B. Section 33 71 01 - Overhead Electrical Distribution.

1.3 STANDARDS

All characteristics, definitions, and terminology, except as specifically covered in this specification, shall be in accordance with the latest revision of the following ANSI and NEMA standards.

- C57.12.00: IEEE Standard General Requirements for Liquid-Immersed Distribution, Power and Regulating Transformers.
- C57.12.20: Overhead-Type Distribution Transformers, 500 KVA and Smaller: High Voltage, 34500 Volts and Below: Low Voltage, 7970/13800Y Volts and Below.
- C57.12.31 IEEE Standard for Pole Mounted Equipment–Enclosure Integrity
- C57.12.35: Bar Coding for Distribution Transformers.
- C57.12.90: IEEE Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers and IEEE Guide for Short-Circuit Testing of Distribution and Power Transformers.
- C57.12.91: Guide for Loading Mineral-Oil-Immersed Overhead and Pad-Mounted Transformers rated 500 kVA and less with 55°C or 65°C average winding rise.
- NEMA TR-1: Transformers, Regulators, and Reactors.

- NEMA TP-1: Guide for Determining Energy Efficiency for Distribution Transformers
- NEMA TP-3: Standard for Labeling of Distribution Transformer Efficiency.
- DOE: 10 CFR Part 431 – Department of Energy – Energy Conservation Program for Commercial Equipment: Distribution Transformers Energy Conservation Standards; Final Rule.
- REA: Bulletin 50-37 (D10), Specification for Rural Distribution Transformers (Overhead.)

1.4 SUBMITTALS

- A. Shop Drawings and Product Data: Provide in accordance with Section 33 05 00 - Common Work Results for Utilities and Division 1.
- B. Submit complete electrical data, mechanical and layout drawings, and wiring and connection diagrams for each type of transformer provided.
- C. Drawings shall indicate the kVA rating, dimensions, transformer impedance, voltage (both primary and secondary), phase of the transformer, and winding connecting.
- D. Provide certified test reports prior to shipment of the transformers. Test reports shall indicate the impedance, no load, and full load loss of each transformer, by serial number, and shall include the transformer efficiency, expressed in percent, of the transformer based on the test procedures specified herein.
- E. Certified test reports shall contain a statement identifying the amount of PCB in the insulating oil.

1.5 WARRANTY

The failure of any transformer due to defective design, material and/or workmanship within 12 months after being energized or eighteen months after being delivered, whichever comes first, shall be repaired or replaced without cost. Any defect in design, material and/or construction discovered within this period shall be corrected at the manufacturer's expense, either by repair or replacement.

PART 2 - PRODUCTS

2.1 RATINGS

- A. General:
1. Primary System Voltage Rating: 2400/4160 volt, grounded wye.
 2. Secondary Voltage Rating: 240/120 volt.
 3. Frequency: 60 Hz.
 4. Phase: Single.
 5. Impedance: ANSI Standard.
 6. kVA Rating: As indicated as indicated in the Bid Schedule.
 7. BIL Rating: 2400/4160Y 95 kV.

8. Temperature Rating: Self-cooled, 65° C above a 30° C ambient.

2.2 ACCEPTABLE MANUFACTURERS

Acceptable manufactures shall be as follows. Manufacturers shall be on the RUS approved list.

- A. ABB.
- B. Cooper Power.
- C. Ermco.
- D. G. E. Prolec.
- E. Howard Transformers.
- F. Approved equal.

2.3 TRANSFORMER VOLTAGES

- A. Transformer primary voltage shall be 2,400 volts.
- B. Unless otherwise indicated in the Bid Schedule, transformer secondary voltages shall be as follows:
 - 1. Transformers used for single-phase service shall be provided with a secondary voltage of 120/240 volt, single-phase, 3-wire utilizing the full transformer capacity.

2.4 TRANSFORMER LOSSES

Transformer no load and load losses shall be provided with the transformer submittal and shall be guaranteed by the manufacturer. Transformer losses determined by the factory tests on the individual transformers shall be less than 10% greater than the guaranteed bid losses. No individual unit shall be shipped that exceeds guaranteed no load losses by more than 10%.

2.5 TRANSFORMER TAPS

Transformers shall be furnished with full capacity high-voltage taps. The taps shall be +/-2 - 2½% above and below rated nominal voltage. The tap changer switch shall be an externally operated switch with a hotstick-operable handle. The tap changer shall be clearly labeled to reflect that the transformer must be de-energized before operating the tap changer as required in IEEE Standard C57.12.20.

2.6 HIGH VOLTAGE BUSHINGS AND TERMINALS

- A. Provide two high voltage bushings. Single bushing transformers will not be acceptable.
- B. The bushing terminals provided shall be tin-plated to accommodate both aluminum and copper conductors. The size of the terminals shall be 5/8”.
- C. The color of the bushings shall match Light Gray Number 70, Munsell Notation 5BG7.0/0.4.
- D. High voltage bushings shall be porcelain.
- E. Provide high voltage bushings rated at 110 or 125 kV BIL.

2.7 LOW VOLTAGE BUSHINGS AND TERMINALS

- A. Low voltage bushings shall be provided with the following ratings.
 - 1. 30 kV BIL Rating.
 - 2. 10 kV 60 Hz Dry 1-Minute Withstand Voltage.
 - 3. 6 kV 60 Hz Wet 10 Second Withstand Voltage.
- B. The bushing terminals provided shall be clamp type to accommodate the use of screw bar post connector.
- C. Provide three porcelain bushings on 120/240 volt transformers.
- D. Provide two porcelain bushings on 277 volt transformers used for three-phase service.
- E. The internal secondary leads shall be permanently embossed with the letters A, B, C, and D per ANSI C57.12.00 and C57.12.20.

2.8 PROTECTION

- A. No overcurrent protection is required. Transformers shall be protected using external fused cutouts installed by others.

2.9 CORE AND COIL

- A. Windings shall be copper or aluminum. All windings shall meet the guaranteed temperature rise requirements.
- B. The core and coil shall be vacuum processed to ensure maximum penetration of insulating fluid into the coil insulation system. While under vacuum the transformer shall be filled with preheated filtered degassed insulating fluid. The core shall be manufactured from burr-free, grain-oriented silicon steel and shall be precisely stacked to eliminate gaps in the corner joints. The coil shall be insulated with B-stage, epoxy coated, diamond pattern, insulating paper, which shall be thermally cured under pressure to ensure proper bonding of conductor and paper.

2.10 TANK

- A. The tank shall include a pressure relief device as a means to relieve pressure in excess of pressure resulting from normal operation. The venting and sealing characteristics shall be as follows.
 - 1. Cracking Pressure: 10-psig \pm 2 psig.
 - 2. Resealing Pressure: 6-psig minimum.
 - 3. Zero leakage from reseal pressure to -8 psig.
 - 4. Flow at 15 psig: 35 SCFM minimum.
- B. The tank coating shall meet all requirements in ANSI C57.12.31 including.
 - 1. Salt Spray Test.
 - 2. Crosshatch Adhesion Test.
 - 3. Humidity Test.
 - 4. Impact Test.

5. Oil Resistance Test.
 6. Ultraviolet Accelerated Weathering Test.
 7. Abrasion Resistance - Taber Abraser.
- C. The tank provided shall have a recessed tank bottom which offers protection when sliding over rough surfaces.
 - D. The tank shall have an internal mark, which indicates the proper oil level per Section 6.2.3 of ANSI C57.12.20.
 - E. Permanently stamped secondary leads.
 - F. The tank covering, and cover ring loops shall be stainless steel. All hardware shall be stainless steel. A bronze nut shall also be provided to eliminate corrosion problems and avoid galling. Provide a visible cover ground.
 - G. Provide a drain/sampling device.
 - H. Provide ground connections accepting #8 AWG solid to #2 AWG stranded. Provide a ground strap between the secondary neutral bushing and the transformer tank.
 - I. The tank shall include arrester mounting pads, grounding provisions, ANSI support lugs (hanger brackets) and lift lugs. Hanger brackets shall be single.
 - J. The tank color shall be ANSI 70 light gray.

2.11 INSULATING OIL

Transformers shall be provided with highly refined inhibited new mineral oil and meet the minimum requirements as specified in Table 1, "Functional Property Requirements," of ASTM D3487 and ANSI C57.106.

2.12 NOISE

Standard transformer sound level shall not exceed the values as calculated per the latest edition of NEMA Publication TR-1.

2.12 NAMEPLATES & LABELS

- A. Diagrammatic nameplate that conforms to the latest edition of ANSI C57.12.00. Impedance of the transformer shall be included on the nameplate. The nameplate shall be etched and black-filled aluminum or stainless steel. Affix to the enclosure with rivets.
- B. In addition to warning labels, provide a label indicating the transformer kVA rating on the front of the transformer, in minimum 2-1/2" black letters.

PART 3 - EXECUTION

3.1 TESTING AND LOSSES

- A. All units shall be tested for the following:
 1. No Load (Core) Losses.
 2. Load Losses at 85°C and rated current.
 3. Percent Impedance at 85°C and rated current.

4. Excitation current (100% voltage) test.
 5. Winding resistance measurement tests.
 6. Ratio tests using all tap settings.
 7. Polarity and phase relation tests.
 8. Induced potential tests.
- B. The manufacturer shall provide certification for all design and other tests listed in Table 17 of ANSI C57.12.00 including verification that the design has passed Short Circuit Criteria per ANSI C57.12.00 and C57.12.90.
- C. One PDF copy of the factory certified test report of each test, in IEEE 1388 format, shall be delivered to the Engineer for review and acceptance prior to shipment of the transformers.

3.2 SHIPPING

- A. Transformers shall be installed on pallets to allow loading and unloading with a forklift.
- B. The transformers shall be packaged to protect them from damage during shipment, handling, and storage.

END OF SECTION